KNOWLEDGE, ATTITUDE AND PRACTICES (KAP) RELATED TO TREMATODE GRANULOMA AMONGST RESIDENTS IN THE RURAL AREAS OF KAVERI RIVER BED.

Dissertation Submitted for

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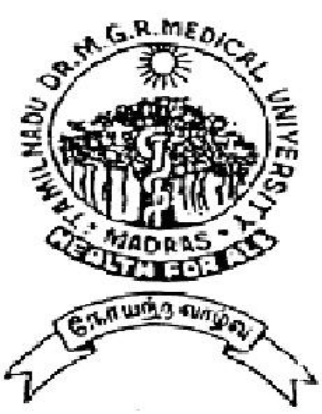

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CHENNAI

CERTIFICATE

This is to certify that this dissertation entitled "**KNOWLEDGE, ATTITUDE AND PRACTICES (KAP) RELATED TO TREMATODE GRANULOMA AMONGST RESIDENTS IN THE RURAL AREAS OF KAVERI RIVER BED."** is a bonafide work done by Dr. Vedang Shah under our guidance and supervision in the Uvea Services of Aravind Eye Hospital and Post Graduate Institute of Ophthalmology, Madurai during the period of his post graduate training in Ophthalmology for May 2011 – April 2014.

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DECLARATION

I, Dr.Vedang Shah, hereby declare that this dissertation entitled, "**KNOWLEDGE, ATTITUDE AND PRACTICES (KAP) RELATED TO TREMATODE GRANULOMA AMONGST RESIDENTS IN THE RURAL AREAS OF KAVERI RIVER BED. "**, is being submitted in partial fulfillment for the award of M.S. in Ophthalmology Degree by the Tamil Nadu MGR Medical University in the examination to be held in April 2014.

I declare that this dissertation is my original work and has not formed the basis for the award of any other degree or diploma awarded to me previously.

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I take this opportunity to pay my respect and homage to Dr.G.Venkatasamy, our founder and visionary, whose dynamism had led Aravind against all odds to its epitome.

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INTRODUCTION

Anterior Chamber Granulomatous uveitis is very common in the children residing in the eastern coast of Tamil Nadu. It causes severe visual impairment. For three decades it was thought to be due to tuberculosis. In-spite of long and adequate treatment, the results were unsatisfactory. Recently new studies done by a group of investigators on the epidemiology of the disease along with the basic research proved it to be trematode infection of the human eye [1].

Trematode induced Granulomatous uveitis is a newly recognized form of intraocular inflammation in the children of south India.[2] It has been found to be caused by the exposure to infected village freshwater ponds. Children taking bath in these ponds have been found to be infected with trematode belonging to the species *Procerovum varium*[1]. These children present with either a subconjunctival nodule or an anterior chamber granuloma.

Vast majority of these children are from east and central districts of Tamil Nadu. The river Kaveri is the major water supply for this part of the country. It serves as the breeding ground for the snails. This explains the endemicity of that parasitic disease in the region.

My study involves understanding the knowledge, attitude and practices of the people regarding this long standing eye condition, living in these endemic areas of the Kaveri river bed.

INTRODUCTION TO UVEITIS

The eye is a valuable sense organ composed of several parts that give us the ability to see.

It is made up of 3 coats:

1. Outermost – Cornea and Sclera
2. Middle –Iris, Ciliary body and Choroid collectively referred as Uvea/Uveal Tract
3. Innermost – Retina

Within these coats are the aqueous humor, the vitreous body and the crystalline lens. The light rays that fall on the clear cornea, pass through the aqueous humor, hit the crystalline lens and from there via the vitreous reach the nervous layer of the eye, the retina. On the retina, with the help of photoreceptor cells, the light rays are converted into electrical signals which are then carried by the optic nerve to the brain where they are interpreted and help us know what we see.

The Iris controls the amount of light entering the eye. In simple words, the opening of the iris in the centre of the eye is known as the pupil. Normally, with the action of dilator and sphincter muscles of the iris, the

pupil constricts in bright light to reduce the light entry whereas in dim light it dilates.

The Ciliary body secretes a clear fluid, aqueous humor, contained in two areas: the anterior chamber between cornea and iris, and the posterior chamber between iris and lens. Aqueous humor maintains the pressure and provides nutrition to the cornea and the lens.

The Choroid is a highly vascular layer between the sclera and the retina. It provides nutrition to the retina, it also contains large amount of brown pigment which serves to reduce reflection or diffuse light when it falls on the retina.

The rich blood supply of the Uvea (choroid part) sometimes makes it vulnerable to the ongoing systemic and local infections and leads to its inflammation; Uveitis

Uveitis is an inflammation of the uveal tract. It includes a wide spectrum of infectious and non-infectious causes. The inflammatory process primarily affects the uveal tissue with subsequent damage to the retina, optic nerve and vitreous [3.] It is a leading cause of blindness in both developed and developing countries.

Uveitis is categorized according to the part of the uveal tract that is affected. It may be classified on the basis of

a) Anatomy
b) Clinical features
c) Aetiology

Anatomical classification: [4]

1. Anterior Uveitis
    i. Iritis, in which inflammation predominantly affects the iris
    ii. Iridocyclitis, in which both the iris and the anterior part of the Ciliary body (pars plicata) are equally involved.

    Many causes are responsible for anterior Uveitis. It can be asymptomatic or give rise to mild redness, decreased vision, lacrimation, photophobia and perception of floaters. Slit lamp examination may reveal circumcorneal ciliary injection, keratic precipitates, cells in the anterior chamber, aqueous flare or iris nodules. Posterior synechiae can be seen as a complication. Other complications include band keratopathy, cataract, glaucoma, macular oedema, cyclitic membrane formation and pthisis bulbi.

Based on the type of inflammation, Anterior Uveitis can be further classified into:

a) Nongranulomatous Uveitis. Photophobia, defective vision and sever pain. On slit lamp examination small and numerous keratic precipitates can be seen on the corneal endothelium.

b) Granulomatous Uveitis. Symptomatically it is less severe than Nongranulomatous Uveitis. On slit lamp examination, few "mutton fat" keratic precipitates are seen on the corneal endothelium. Koeppes nodules, clusters of cells on the papillary margin of iris, or Busaccas nodules, clusters of cells on the anterior iris surface are also seen.

2. Intermediate Uveitis, characterized by involvement predominantly of the posterior part of the Ciliary body (pars plana), the extreme periphery of the retina and the underlying choroid.

   Initially floaters are seen and later there is impairment of visual acuity due to cystoid macular oedema. On slit lamp examination we can see vitritis with few cells in the anterior chamber. Complications include cystoid macular oedema, cyclitic membrane formation, cataract and tractional retinal detachment.

3. Posterior Uveitis involves inflammation of the choroid and retina posterior to the vitreous base. Floaters and impaired vision are the common complaints. Slit lamp examination shows choroiditis, retinitis, vitreous cells, flare and opacities. Complications include direct involvement of the macula by the inflammatory process, oedema, ischaemia, epiretinal membrane formation, vascular occlusions, choroidal neovascularizations, retinal detachment and consecutive optic neuropathy.

   It can be further classified morphologically: [4]

   a. Focal
   b. Multifocal
   c. Geographical

4. Panuveitis, involvement of the entire uveal tract.

Clinical classification: [4]

1. Acute Uveitis usually has a sudden symptomatic onset and persists for up to 3 months. If the inflammation recurs following the initial attack, it is referred to as recurrent acute.

2. Chronic Uveitis persists for longer than 3 months. The onset is frequently insidious and may be asymptomatic although acute or subacute exacerbations may occur.

Aetiological classification: [4]

Exogenous Uveitis is caused by external injury to the uvea or invasion by microorganism (or other agents) from within the patient. The following are the main types:

1. Associated with a systemic disease (e.g. sarcoidosis).
2. Infection with bacteria (e.g. tuberculosis), fungi (e.g. candidiasis) and viruses (e.g. herpes zoster).
3. Infestation with protozoa (e.g. toxoplasmosis) or nematodes (e.g. toxocariasis).
4. Idiopathic specific Uveitis entities are a group of unrelated disorders unassociated with underlying systemic disease but with special characteristics of their own warranting independent description (e.g. Fuchs Uveitis syndrome).
5. Idiopathic non-specific Uveitis entities which do not fall into any of the above categories constitute about 25% of cases.

Clinical workup:

1. Uveitis work up starts with proper history taking. Complete ocular and systemic history directed at most likely etiology should be obtained.
2. Symptoms produced by uveitis depends on which part of the uveal tract is inflamed, rapidity of onset, duration of the disease and its course[5.] The most common symptoms of uveitis includes

- Redness
- Pain
- Photophobia
- Watering
- Visual disturbances
- Floaters

3. Subsequently meticulous systemic and ocular examination will offer clinical conclusions:

a) Signs of uveitis in anterior segment include-

- Keratic precipitates
- Inflammatory cells
- Flare

- Hypopyon
- Iris nodules
- Synechiae, both anterior and posterior
- Band keratopathy

b) Signs of posterior uveitis include-

- Inflammatory cells and bands in vitreous
- Snowbanking
- Retinal edema
- Cystoid macular edema
- Epiretinal membranes
- Infiltrates
- Neovascularizations

SUN Classification for grading of Anterior Chamber cells: [4, 6]

Cells in Field	Grade
<1	0
1-5	+/-
6-15	+1
16-25	+2
26-50	+3
>50	+4

SUN Classification for Grading of Aqueous Flare: [4, 6]

Description	Grade
Nil	0
Just detectable	+1
Moderate (iris and lens details clear)	+2
Marked (iris and lens details hazy)	+3
Intense (fibrinous exudates)	+4

SUN Working Group "Activity of Uveitis" Terminology: [4, 6]

Inactive	Grade 0 cells in AC
Worsening activity	2 step increase in level of inflammation
Improving activity	2 step decrease in level of inflammation
Remission	Inactive disease for >3 months after discontinuing all treatment for eye disease

SUN Working Group "Descriptors in Uveitis": [4, 6]

Onset: Sudden/Insidious

Duration: Limited: <3months duration

Persistent: >3months duration

Course: Acute: Sudden onset and limited duration

Recurrent: Repeated episodes separated by periods of inactivity without treatment 3 months duration

Chronic: Persistent Uveitis with relapse in <3 months after discontinuing treatment

Remission: Inactive disease for at least 3 months after discontinuing treatment

Recommendation of the International Uveitis study group for the anatomic classification of Uveitis. [7]

Anterior Uveitis	Intermediate Uveitis (Formerly known as pars planitis)	Posterior Uveitis	Pan Uveitis
Iritis Iridocyclitis Anterior cyclitis	Posterior cyclitis Hyalitis Basal retinochoroiditis	Focal Multifocal Diffuse Choriditis Chorioretinitis Retinochoroiditis	Focal Multifocal Diffuse Choriditis Chorioretinitis Retinochoroiditis

Laboratory investigations [8, 9, 10, 11]

Approach to laboratory diagnosis in uveitic cases should then be directed by the history, patient's symptoms and signs and clinical examination depending on the likely etiology

General investigations:

1. Complete blood count
2. Chest X-Ray
3. Erythrocyte sedimentation rate
4. FTA-ABS, TPHA or VDRL (for active case of syphilis)
5. Mantoux test for TB
6. Investigation to rule out or confirm any other systemic illness like diabetes etc.

Specific investigations:

1. ACE (Angiotensin converting enzyme) - sarcoidosis
2. ANA (AntiNuclear Antibody) - autoimmune disorders
3. ANCA (Anti Neutrophil Cytoplasmic Antibody) – Wegener's Granulomatosis
4. Choroidal biopsy
5. Conjunctival biopsy – sarcoidosis
6. CT Scan of Orbits/ USG – posterior scleritis
7. CT Scan chest – sarcoidosis
8. Enucleated eyeball for histopathology – sympathetic ophthalmia
9. ELISA – leptospirosis, toxoplasmosis, toxocariasis

10. FFA and ICG (fundus angiography) – choroidal inflammatory diseases
11. HIV/ELISA/Western Blot
12. MAT (micro agglutination test) – leptospirosis
13. MRI Head Scan – lymphoma and neurosarcoidosis
14. OCT to study the macular status
15. PCR of intra ocular fluid – e.g. herpes
16. Rheumatoid factor
17. UBM (Ultrasound Bio Microscopy) – to study the angle structures
18. Vitreous biopsy
19. X-Ray – chest and sacroiliac joint

Apart from the routine investigations, ancillary investigations like:

1. ultrasound biomicroscopy
2. fundus fluorescin angiography
3. indocyanine green angiography
4. laser flare meter

are very useful in diagnosing and monitoring inflammation in the anterior and posterior segment [12].

Principles of treatment:

Treatment of immune mediated uveitis involves predominantly the use of anti-inflammatory and immunosuppressive agents along with mydriatics.

The main aim of the treatment is to prevent vision threatening complications, relieve patient's discomfort and treat the underlying cause [4].

Drugs used commonly for the treatment of uveitis include topical/periocular/systemic steroids, in conjunction with mydriatics and cycloplegics.

Topical therapy includes prednisolone acetate 1% ophthalmic suspension. The drops should be dosed according to the disease activity and can be used as frequently as every half an hour while awake. However the main side effects of topical steroids include elevated intraocular pressure and cataract formation.

Triamcinolone acetonide 40mg can be given via transconjunctival, transdermal and posterior sub-Tenon's route [13]. The most feared complication is inadvertent ocular penetration. Intravitreal triamcinolone can also be given in cases of intermediate, posterior and Panuveitis. Side effects

like endophthalmitis and raised intraocular pressure should always be kept in mind.

Systemic steroids are the main stay of therapy in uveitis. They are usually started at 1mg/kg/day for upto a month or till disease is under control. The most common side effects include cushingoid effects, osteoporosis, hypertension and fluid retention.

Occasionally immunosuppressive agents also need to be used where there is no response to steroids or when the side effects from the steroids cannot be tolerated. Immunosuppressive agents are also referred to as corticosteroid-sparing agents. These include several classes of drugs like antimetabolites, T-cell inhibitors and alkylating agents. Methotrexate, cyclosporine are the commonly used immunosuppressive drugs.

Biologics represent the newest class of drugs for the treatment of autoimmune disease. They modulate the immune response and control the inflammation. . It should also be remembered that systemic therapy should always be carried out in association with a physician. Potential side effects of the drugs should always be kept in mind and this should be weighed against the decision to treat.

Apart from the medical treatment, surgical treatment may also be required in special conditions.

The main indications include phaco-antigenic uveitis, complicated cataract, pupillary reconstruction following formation of papillary membranes, glaucoma surgery, vitrectomy and ILM peeling [14].

In uveitis it is mandatory to wait for at least 3 months after the last episode of an active disease to undergo an elective surgery for visual rehabilitation [14, 15.] Complications of cataract surgery in uveitis include posterior capsular rent, cystoid macular edema persistent inflammation secondary glaucoma and early posterior capsular opacification.

DESCRIPTION OF A "KAP" STUDY

KAP stands for Knowledge, Attitude and Practice.

The Knowledge possessed by a community refers to their understanding of any given topic (trematode uveitis in this case).

Attitude refers to their feelings, as well as any preconceived ideas that they may have towards it.

Practice refers to the ways in which they demonstrate their knowledge and attitude through their actions.

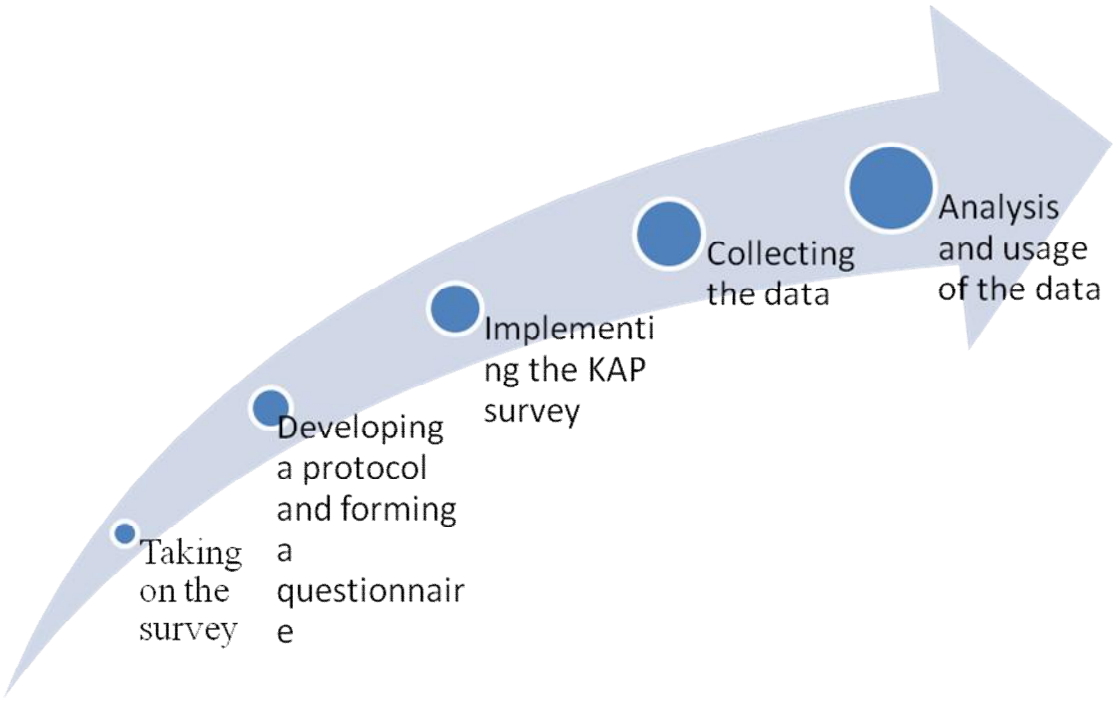
A KAP study is conducted to investigate the human behavior related to a certain topic. It identifies what people know (Knowledge), how they feel (Attitude) and what they do (Practice).

It can be implemented to increase the insights in a current situation and help design appropriate interventions. A KAP study can also be used to evaluate the effectiveness of certain interventions or programmes [16]. A KAP study is more like a conceptual framework to study human behavior than a scientific methodology.

To begin a KAP study the following components should always be kept in mind:

1. Before beginning the process of creating awareness in any community, the environment in which the awareness is required should be assessed.
2. One should decide the project and define the survey objectives. It should contain all information regarding the purpose of the survey, areas of enquiry and identification of the survey population and the sampling plan.
3. Next the survey protocol should be prepared. It outlines the elements to include in the survey protocol, identify key research questions and create a working plan and budget.
4. A questionnaire is then made for the implementation of the data analysis plan. The questionnaire is implemented in the field after choosing survey dates, recruiting and training interviewers.
5. Data collected is finally analyzed. This analyzed data is then used to translate the survey findings into action and disseminate the survey findings by creating awareness amongst the people.

Cycle of a KAP survey project



KAP study can be of either a Baseline study or a RE KAP or evaluative KAP study.

1. The KAP study conducted in a region where no awareness programs or preventive campaigns have been conducted is called a Baseline KAP. The findings of the baseline KAP provide a solid basis for planning future campaigns and health programs. It also serves as a benchmark for evaluative KAP.

2. The RE KAP or Evaluative KAP can be used as a significant tool to evaluate the impact and efficiency of the various programs and campaigns which are carried out at community levels to create awareness amongst the people.

The more frequently a KAP survey is implemented, the more will be the effectiveness. It will give an up-to-date database about the knowledge, attitudes and practices, as well as qualitative information on the problems faced by the people.

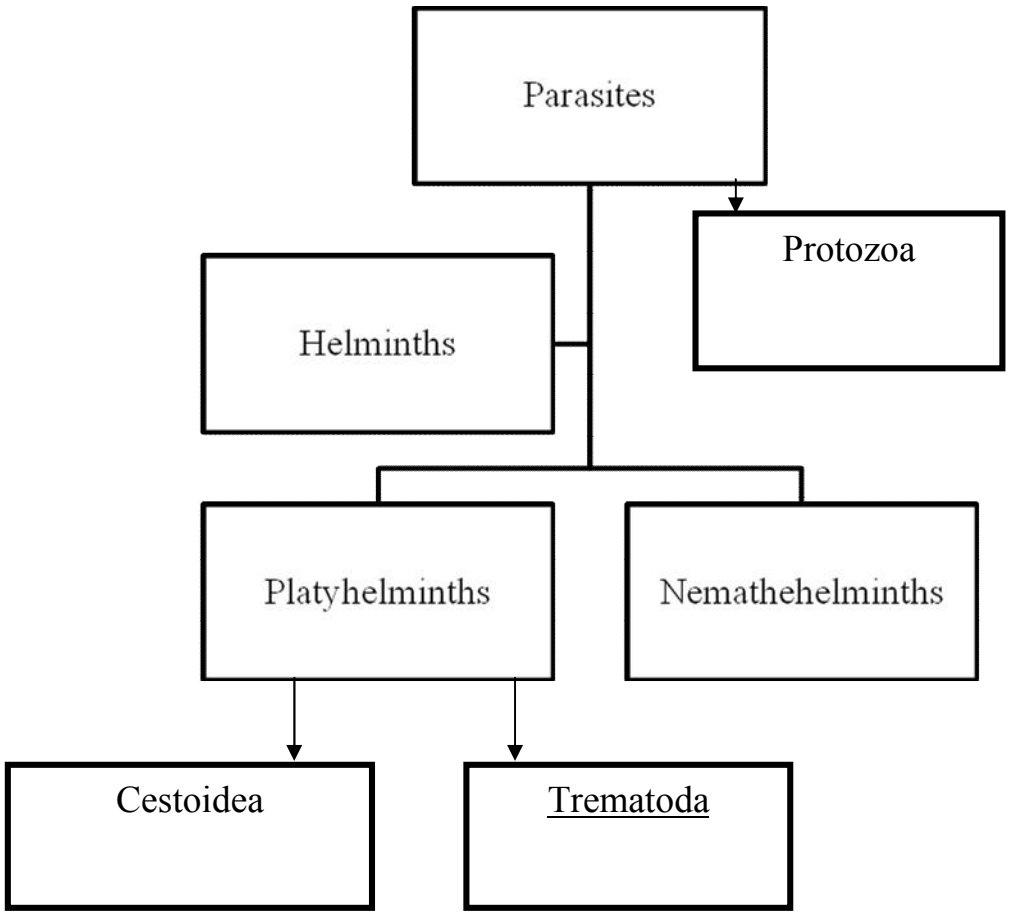
The major advantages of the KAP study are:

a) The strength of the structured questionnaire
b) Ability to collect unambiguous answers leading to a good qualitative and quantitative analysis.
c) Comparatively small size of sample is needed to generalize the results on the population.
d) Simple survey design.
e) Gives the possibility for cross cultural comparison.

However the limitations of the KAP study are the reliability and validity of the data and the inability to express the measurement of the intensity of the opinions or attititudes reported. The pre-coded choices may not be sufficiently comprehensive and not all answers may be easily accommodated. Some respondents may therefore be forced to choose inappropriate pre-coded answers that might not fully represent their views [17]. Besides the KAP study can be expensive and time consuming. There is also a potential for interviewer bias, recall bias and framing, in which respondents replies are influenced by the design of the questionnaire. Few questions are about socially desirable attitudes, states and behavior leading to potential social desirability bias.

INTRODUCTION TO TREMATODE SPECIES

Trematoda is a class within the phylum Platyhelminthes that contains three groups of parasitic flatworms, commonly referred to as “flukes”. These groups of parasitic worms are Cestoda, Monogena and Trematoda. Trematodes known to infect humans belong to the subclass Digenea, a group made up of more than 40,000 species with diverse morphologies and life cycles [18]. Trematode infection of the human eye is considered rare; however, several sporadic cases from various parts of the world have been reported.



Morphologically Trematodes vary in size from few millimeters to 75mm or more. They are characterized by a sucker around the mouth and an additional ventral sucker that is used for locomotion and attachment to the host. They have a tegument, which is a syncitial epithelium. It comprises of an outer, anucleate layer of cytoplasm connected by cytoplasmic strands to the nucleated portions of the cyctoplasm. In addition to its protective role, the tegument has numerous other functions like absorption of nutrients; although they have a well developed gut, materials can be brought in via the tegument. Synthesis and secretion of various nutrients, excretion and osmoregulation is also carried out by the tegument [19].

The outer plasma membranes possess a coating called the glycocalyx. As an integral part of the tegument (i.e., not just an adherent extraneous layer) it probably plays a role in the protective, absorptive and immunological properties of the tegument.

Muscular System:

Longitudinal and circular muscle layers occur near the body surface

Some fibers occur with the suckers

Nervous System:

Paired ganglia at the anterior end of the body serve as the brain. From this, nerves extend anteriorly and posteriorly. Sensory receptors are, for the most part, lacking among the adults. They do have tangoreceptors.

Excretion and Osmoregulation:

It has a protonephridial system consisting of flame cells. Ducts or tubules contain fingerlike projections that presumably aid re-absorption by increasing the internal surface area.

Digestive System:

The mouth leads to the pharynx, the esophagus, and the gut (caecum) which generally has 2 branches. There is usually no anus, although in a few species (echinostomes) an opening exists between the caeca and the excretory vesicle.

Food of trematodes consists of blood, mucus and tissue.

The mode of feeding is suctorial, associated with the attachment process of the oral sucker and muscular pharynx. Digestion in most species is extracellular in the caeca.

Reproductive Systems:

Most trematodes are hermaphroditic (a notable exception are the schistosomes) and some of these can self-fertilize.

Most engage in cross-fertilization.

Most trematodes possess an ovicapt, an enlarged portion of the oviduct where it joins the ovary. It probably controls the release of ova and spaces out their descent down the uterus.

LIFE CYCLE: [20]

Eggs leave the host and are either eaten by a snail in which they hatch, or they hatch in the water and become a ciliated free-swimming larva called the miracidium.

If it is a free-swimming miracidium it must penetrate the snail host Soon after penetration, the larva discards its ciliated epithelium and etamorphoses into a simple sac-like sporocyst. Germinal cells within the sporocyst develop into rediae (singular redia) These mature and emerge from a birth pore or are liberated by rupture of the sporocyst. Each germ cell in the redia develops into a cercaria

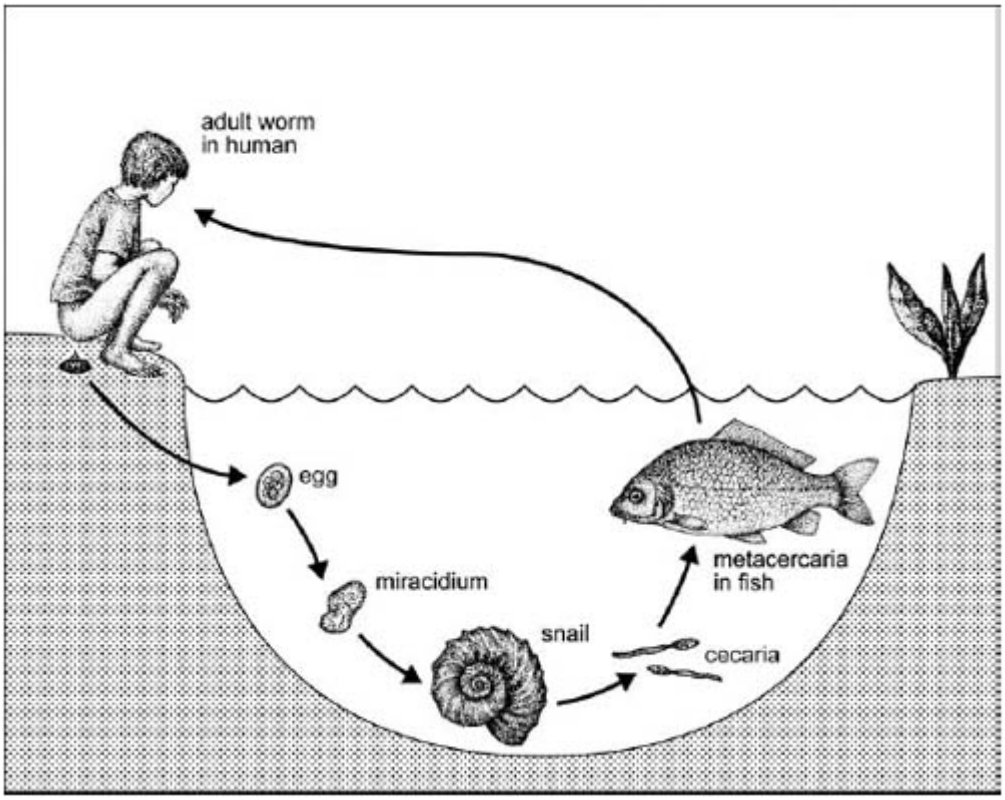
TYPES OF SNAILS

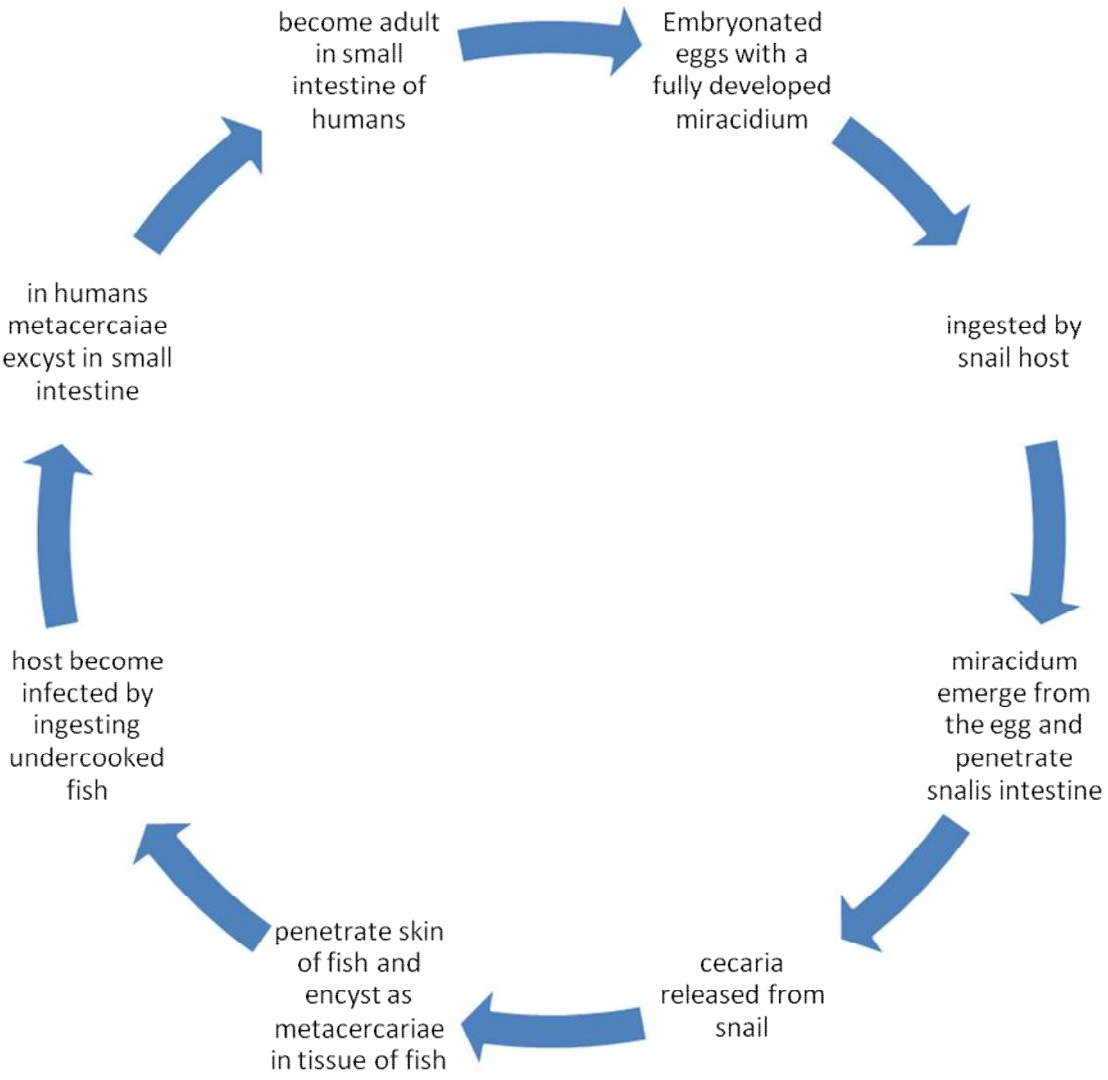
These also mature and emerge from a birth pore or are liberated by rupture of the redia. Cercariae leave the snail host and are propelled through the environment by a tail-like structure.

Cercariae usually develop into encysted metacercariae in a second intermediate host. The fully developed, encysted metacercaria is infective to the definitive host and develops there into the adult trematode.

Man is the definitive host, while fresh snails act as intermediate hosts.

Mode of trematode infections can be either by ingestion of encysted cercariae, present in vegetables or fish.


adult worm
in human
egg
miracidium
snail
cecaria
metacercaria
in fish



Life cycle of Trematode

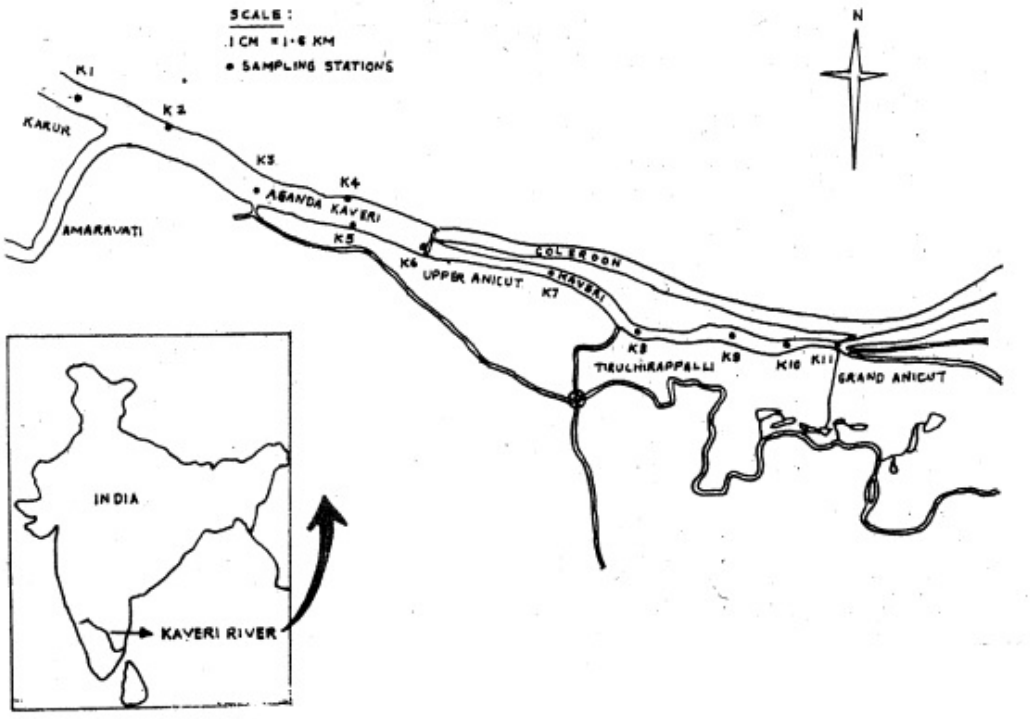
DESCRIPTION OF TREMATODE UVEITIS

Trematode infection of the human eye is considered rare; however, several sporadic cases from various parts of the world have been reported.

Figure 1. Geographic distribution of patients with the anterior chamber nodules from various districts of South Indian states , Tamil Nadu and Kerala

Trematode induced granulomatous uveitis is a newly recognized intraocular inflammation[2]. It is more prevalent in specific geographic distributions which include various districts in south India (Tamil Nadu and

Kerala) [21]. The river Kaveri is the major water supply for this part of the country. The perennially high ground water level in this region is contributory to the breeding and propagation of the snails that serve as an intermediate host of the trematode.



Location of Kaveri river basin

The uveitis mostly affects the pediatric age group, under the age of 15 yrs. It is seen more in males than in females. These children give a history of exposure to infected freshwater ponds like, taking bath in these ponds at a specific time of the day i.e. at noon and in a specific season i.e. summer;

where the host agent interaction is maximum. The cercariae are understood to enter the human body by ingestion of the encysted cercariae in vegetables and fishes or via direct penetration. These die after penetration and their death causes local inflammatory reaction. The children affected by these cercariae present with complains of pain, redness, watering and defective vision. They are often noted to have a subconjuctival nodule or an anterior chamber granuloma causing an anterior uveitis. Children with anterior chamber nodules of less than 3mm in their greatest dimension are started on topical steroids. If uveitis does not respond, patients are given oral corticosteroids at a daily dosage of 1mg/kg. This is tapered to an alternate day regime for a total of 3-6 weeks. Children with anterior chamber nodule of 3mm or larger undergo aspiration of the nodule. Informed consent is taken from the parents. All the children are then followed up with topical corticosteroids. Limbal cryotherapy under short general anesthesia along with topical steroids has also been tried in treating presumed parasitic angle granuloma effectively[22].

Histopathological examination of the nodules taken from the anterior chamber by aspiration revealed inflammatory process made up of lymphocytes, neutrophils and histiocytes. The conjunctival nodule showed

zonal necrotizing granuloma. Histopathological examination of the granuloma shows 'SPLENDORE HOEPPLI PHENOMENON' [18].

The trematode uveitis resolves in most cases. However complications like amblyopia, cataract, corneal opacity and glaucoma are known to occur.

Trematode uveitis is often misdiagnosed as 'idiopathic anterior uveitis and treated with steroids and cycloplegics but refractory to medical treatment. No case of posterior uveitis has been observed. Recurrences are common when the patient engages in water related activities recurrently. Differential diagnosis includes pingeculitis, anterior scleritis, hansen's uveitis, tuberculosis uveitis and post traumatic uveitis.

Granulomatous anterior uveitis associated with nodules accounted for one third of the pediatric uveitis cases seen in the uvea clinic of the tertiary eye centre. Rathinam et al in their study have described in details about the presentation, treatment and molecular identification and the life of the agent causing trematode induced anterior chamber granuloma [1, 2, 18].

AIMS AND OBJECTIVE

1. To understand the Knowledge, Attitude and Practices (KAP) related to Trematode Granuloma amongst residents in the rural areas of Kaveri river bed.

2. To study ,

- Awareness regarding Trematode Granuloma.
- Attitude and Health Care seeking behaviour of the people.

Secondary Objective :

To increase awareness and educate people regarding the preventive aspect of the disease.

Design

This is a population based cross-sectional KAP survey. The study was conducted in different villages in the geographic distribution pertaining to the condition.

METHODS

Study setting

A descriptive cross sectional study was conducted from April 2012 to June 2013. Door-to-door survey in the central districts of Tanjore, Dimisal, Kottaipattinam, Thondi, Nagapattinam, Sivgangai, Manalmelkudi, Trichy and Puddukottai was conducted. These are the main areas where the disease is concentrated.[21]

These villages were visited by a team comprising of a health worker of the respective area, a research scientist and myself.

The objectives and rationale of the survey were discussed with local village heads, responsible seniors and officials to enlist their cooperation and support. These measures yielded excellent public compliance.

The screening instrument

Survey questionnaire was prepared and administered to the people in their local language. The questionnaire contained 22 questions. These questions were relevant to the objectives of the study, thereby increasing the efficiency of the questionnaire in collecting the information. It was designed

to cover the knowledge, attitude and practice towards trematode induced uveitis. The interview was conducted in my presence and filling out of the questionnaire were supervised and crosschecked by me. Responses to questions were coded.

In the survey area, contact was attempted at every 5th house and the inhabitant who was readily available, willing to give consent to the request of the researcher was interviewed personally. Only those aged 21 years and above were interviewed. No two respondents were from the same family.

The interviews were conducted by the health worker of that area who had undergone an orientation to the questionnaire. The questions were asked in one-to-one interview in the local language i.e. Tamil. No attempt was made to prompt the responder by suggesting answers directly.

RESULTS:

DEMOGRAPHICS

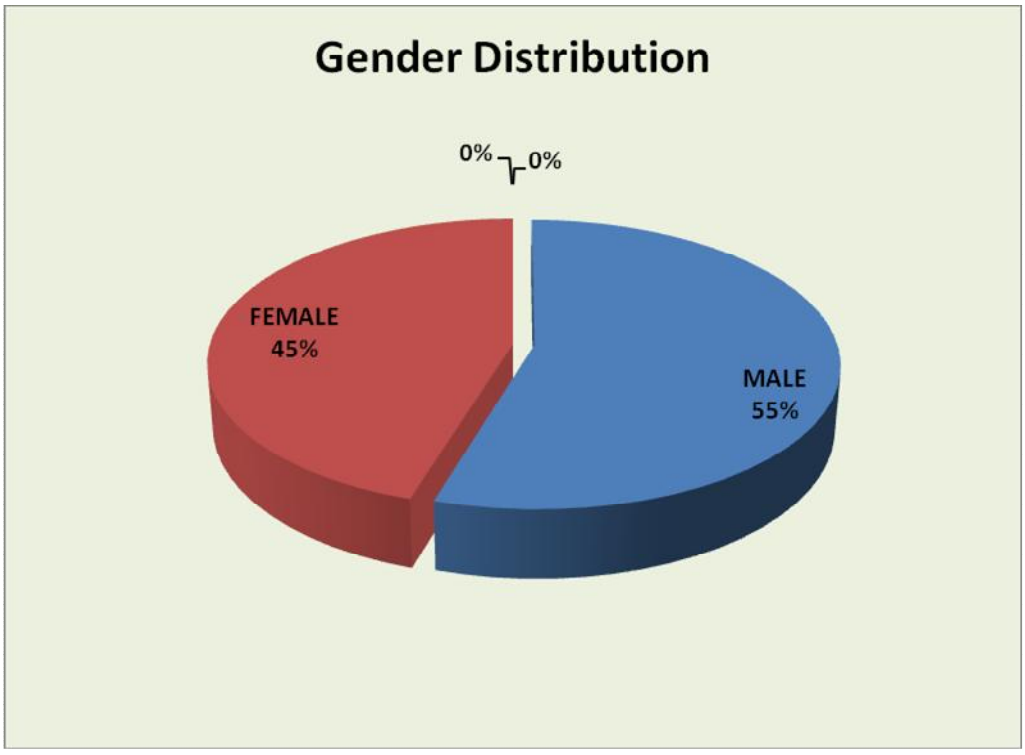
Mean Age

Variable	Mean(SD)	Max	Min
Age	43.4(12.0)	22	72

The mean age group of the respondents was 43.5 years. Majority of them were males.

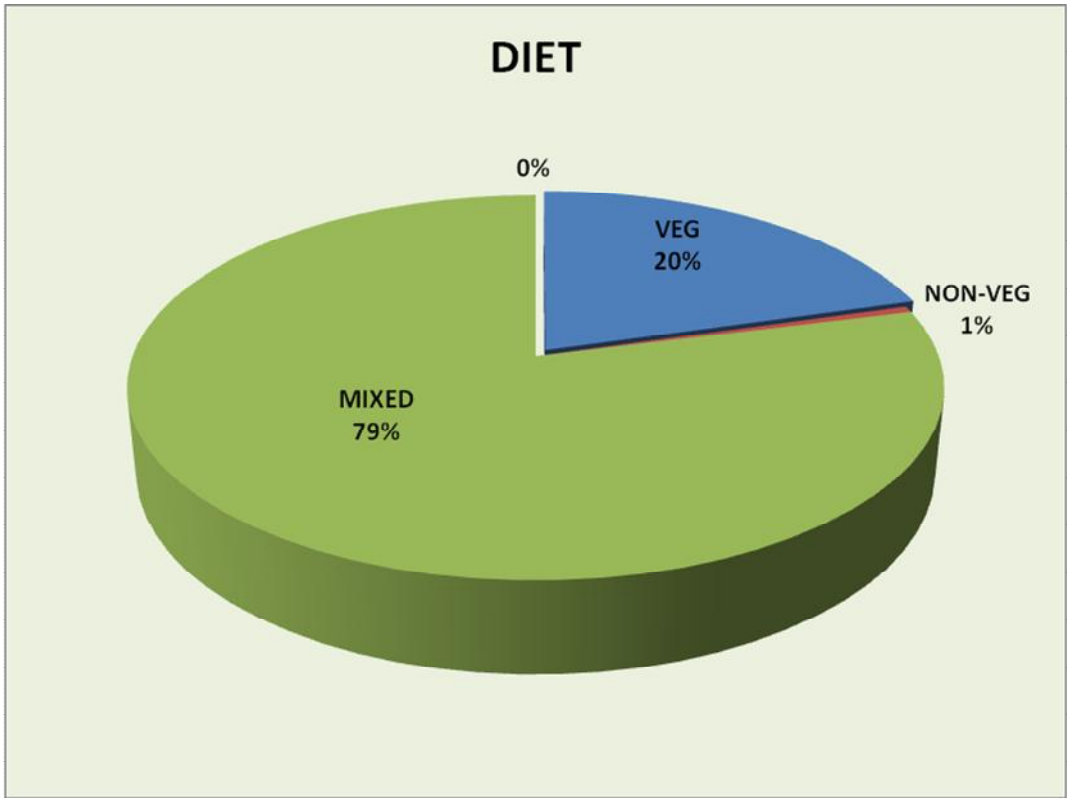
Sex

Sex	Frequency	Percentage
Male	115	54.8%
Female	95	45.2%
Total	210	100.0%



Diet

Diet	Frequency	Percentage
Vegetarian	43	20.5%
Non-Vegetarian	1	0.5%
Mixed	166	79.0%
Total	210	100.0%

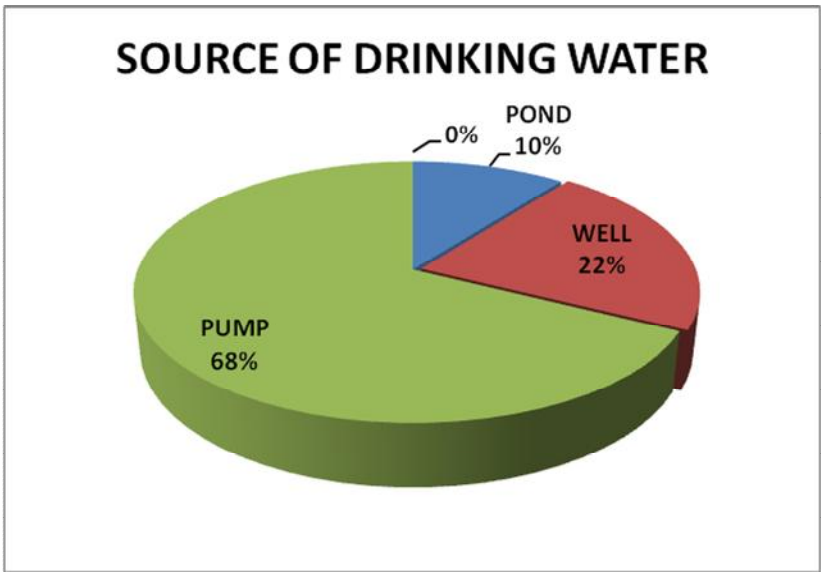


Majority of the respondents had a mixed diet.

KNOWLEDGE

Q1 : From where do you get your drinking water?

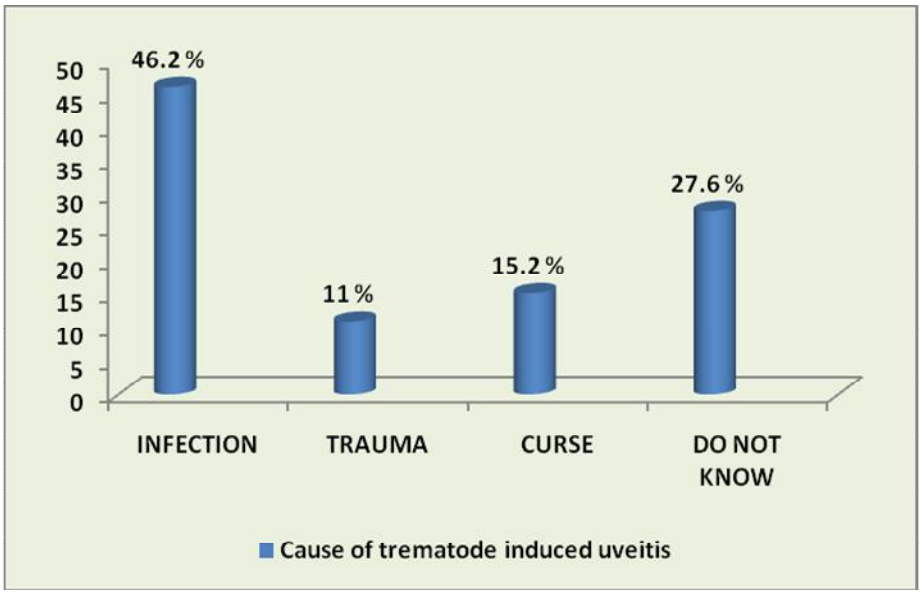
KQ1	Frequency	Percentage
Pond	22	10.5%
Well	46	21.9%
Pump	142	67.6%
Total	210	100.0%



Majority of the villagers use pump water for drinking. This is followed by well water and then pond water.

Q2: How is the condition as shown in the picture caused ?

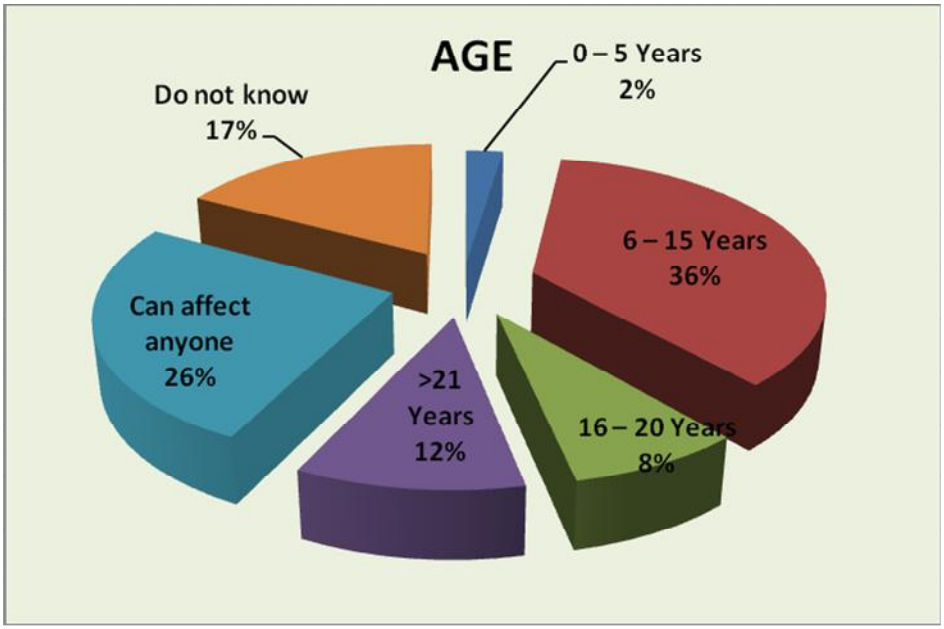
KQ2	Frequency	Percentage
Infection	97	46.2%
Trauma	23	11.0%
Curse	32	15.2%
Do not know	58	27.6%
Total	210	100.0%



Most of the residents of the village were aware about the disease condition shown in the picture and correctly attributed infection as a cause.

Q3: In which age group is the condition most common ?

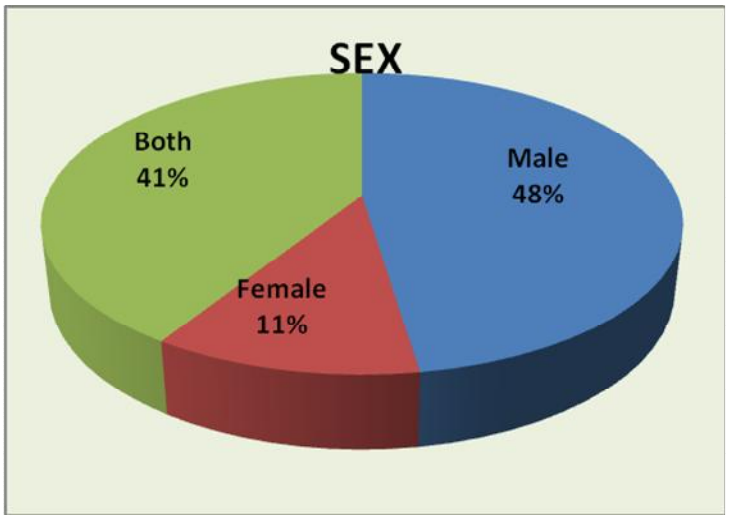
KQ3	Frequency	Percentage
0 – 5 Years	5	2.4%
6 – 15 Years	76	36.2%
16 – 20 Years	17	8.1%
>21 Years	22	10.5%
Can affect anyone	54	25.7%
Do not know	36	17.1%
Total	210	100.0%



One third of the respondents correctly pointed out that the condition was common in the age group of 6-15 years.

Q4: The disease condition affects which gender more?

KQ4	Frequency	Percentage
Male	100	47.6%
Female	24	11.4%
Both	86	41.0%
Total	210	100.0%

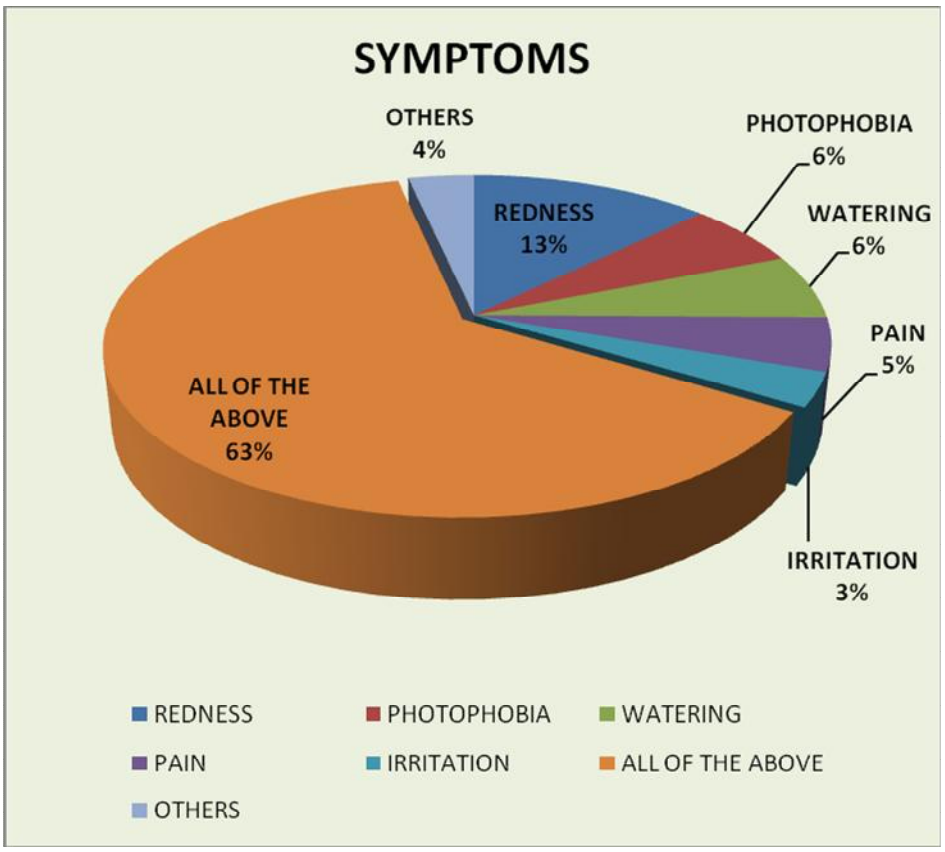


Nearly half of the respondents emphasized that the eye condition was more common in young males as compared to females. About 40% people felt that the disease could affect any gender.

Q5: What are the symptoms of the eye disease?

KQ5	Frequency	Percentage
Redness	27	12.8%
Photophobia	13	6.2%
Watering	13	6.2%
Pain	11	5.2%
Irritation	7	3.3%

All the above	132	62.8%
Others	2	1.0%
Redness & Photophobia	1	0.5%
Redness & Irritation	1	0.5%
Photophobia & Irritation	1	0.5%
Pain & Irritation	2	1.0%
Total	210	100.0%

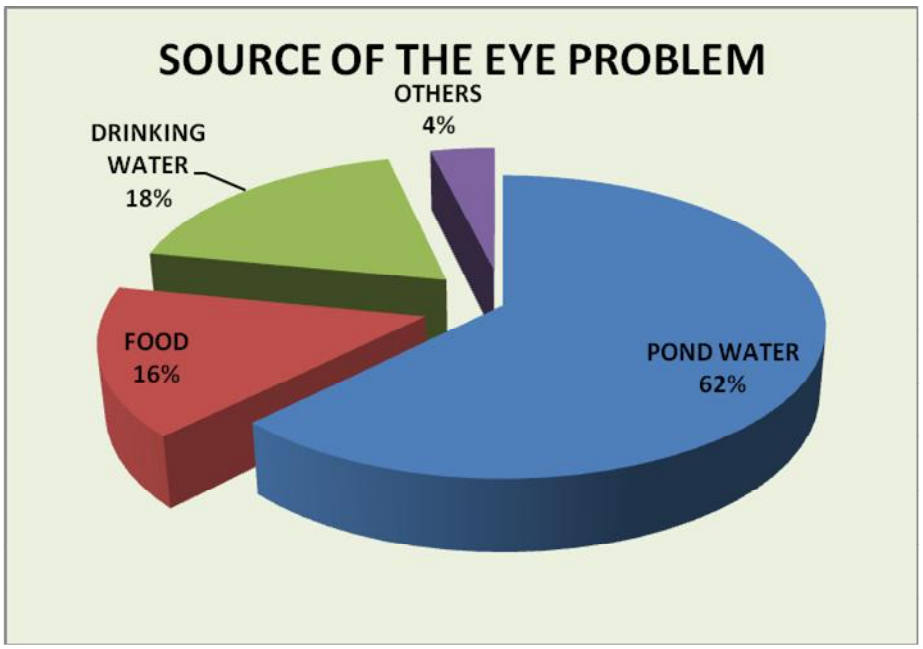


Most of the villagers were aware that the affected eye presented with redness, defective vision, watering, pain, photophobia and irritation.

Q6: Source of spread of the eye disease?

KQ6	Frequency	Percentage

Pond water	131	62.4%
Food	33	15.7%
Drinking water	38	18.1%
Other	8	3.8%
Total	210	100.0%

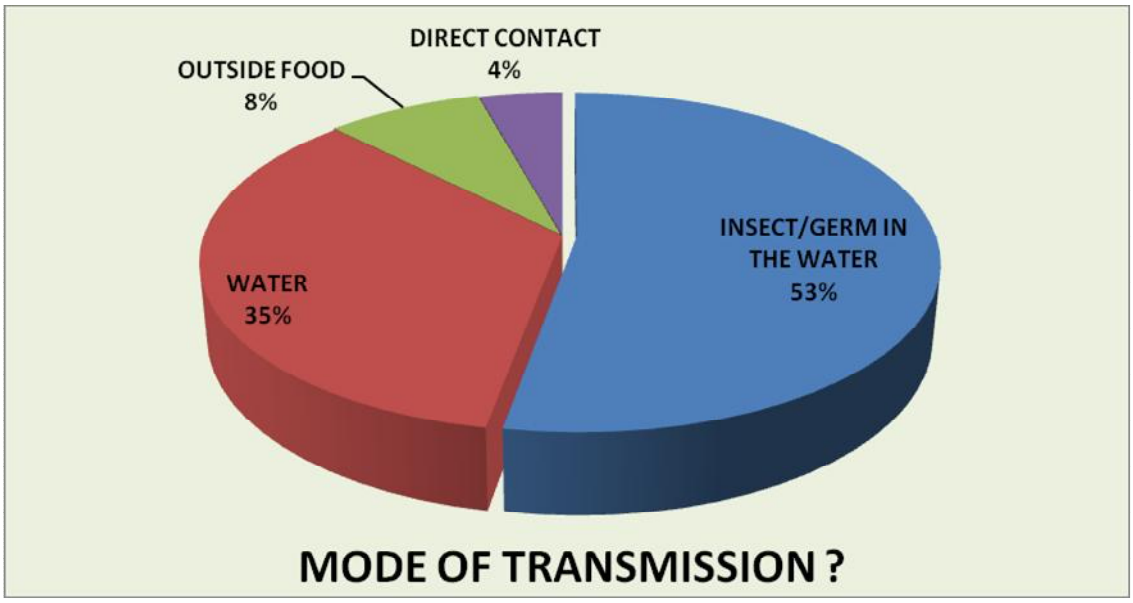


Very correctly, most of the respondents pointed out that taking bath in the pond water were the source of infection.

Q7: Mode of spread of the condition?

KQ7	Frequency	Percentage

Insect in the water	111	52.9%
Water	73	34.7%
Outside food	17	8.1%
Direct contact	9	4.3%
Total	210	100.0%

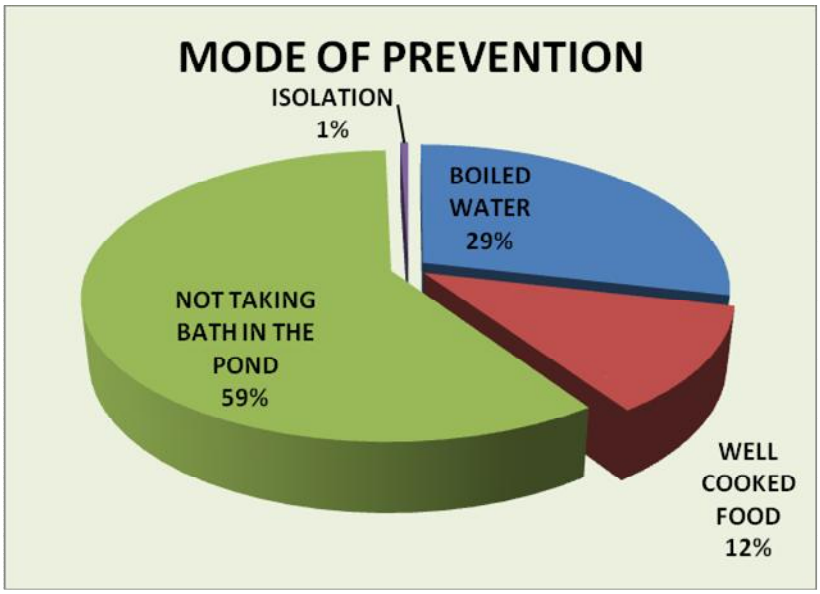


Most of the people felt that the eye condition was caused due to some organism present in the pond water. This organism entered the body during bathing and caused the disease.

Q8: Mode of prevention of the condition?

KQ8	Frequency	Percentage

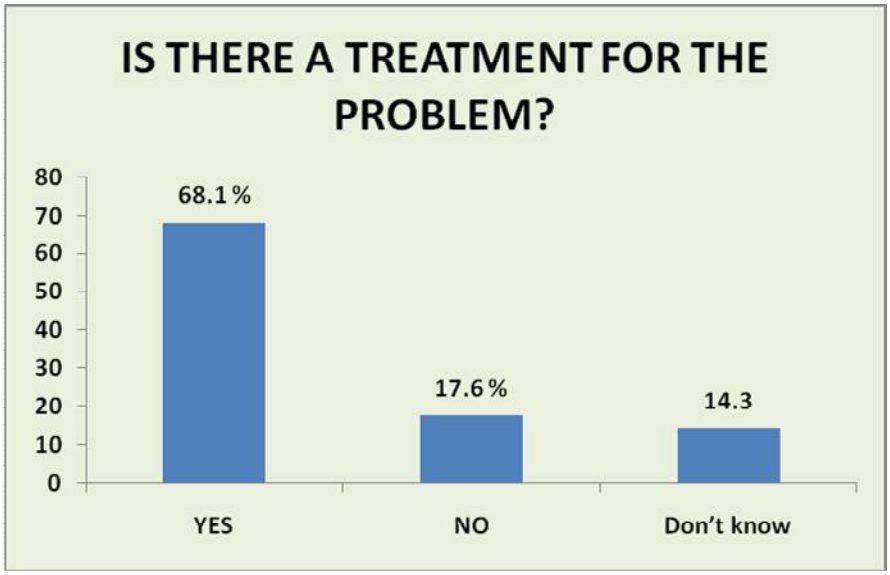
Boiled water	60	28.6%
Well cooked food	25	11.9%
Not taking bath in pond	124	59.0%
Isolation	1	0.5%
Total	210	100.0%



More than half of the people suggested that the eye condition could be prevented by not taking bath in the pond water. Few of them said boiled water or well cooked food would prevent it.

Q9: Is there any treatment for the problem?

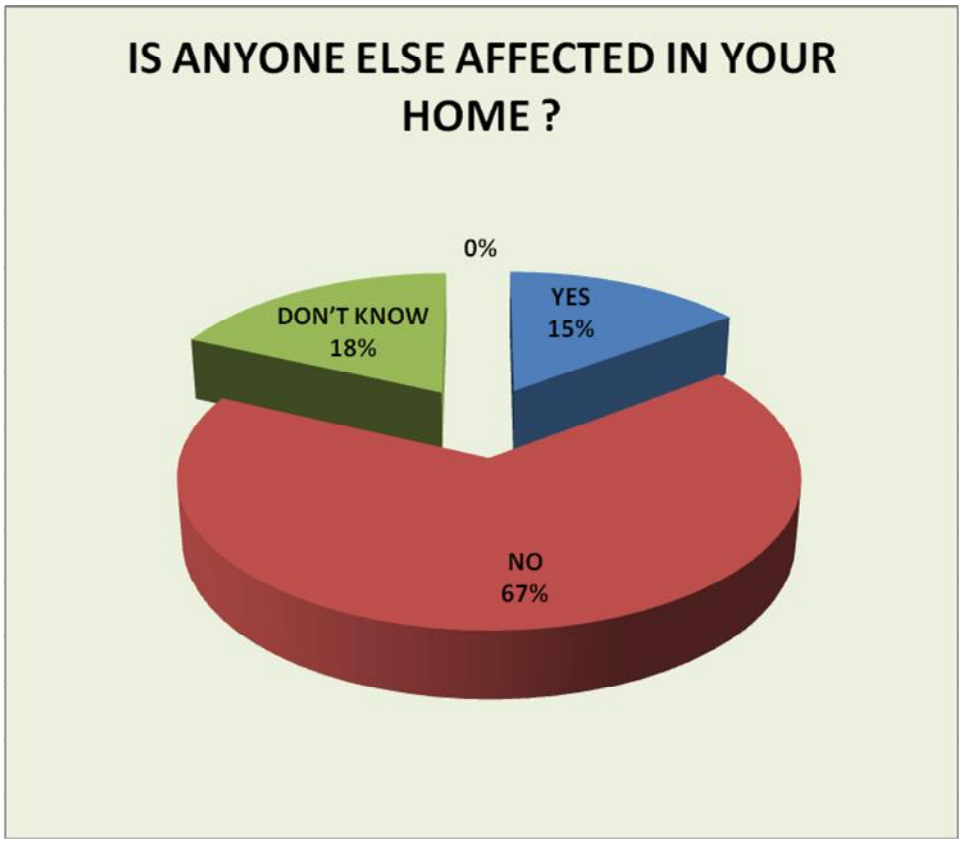
KQ9	Frequency	Percentage
Yes	143	68.1%
No	37	17.6%
Don't know	30	14.3%
Total	210	100.0%



Majority of the respondents felt that treatment was possible for the eye condition. Though they were not sure about the treatment facilities available close to them for the given eye condition.

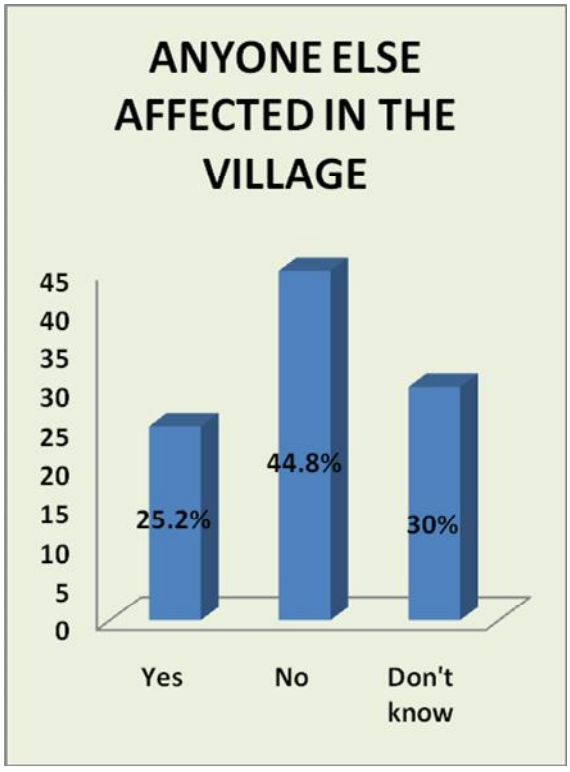
Q10 Is there anyone else affected in the house?

KQ10	Frequency	Percentage
Yes	31	14.8%
No	141	67.1%
Don’t know	38	18.1%
Total	210	100.0%



Q11. : Is there anyone else affected in the village?

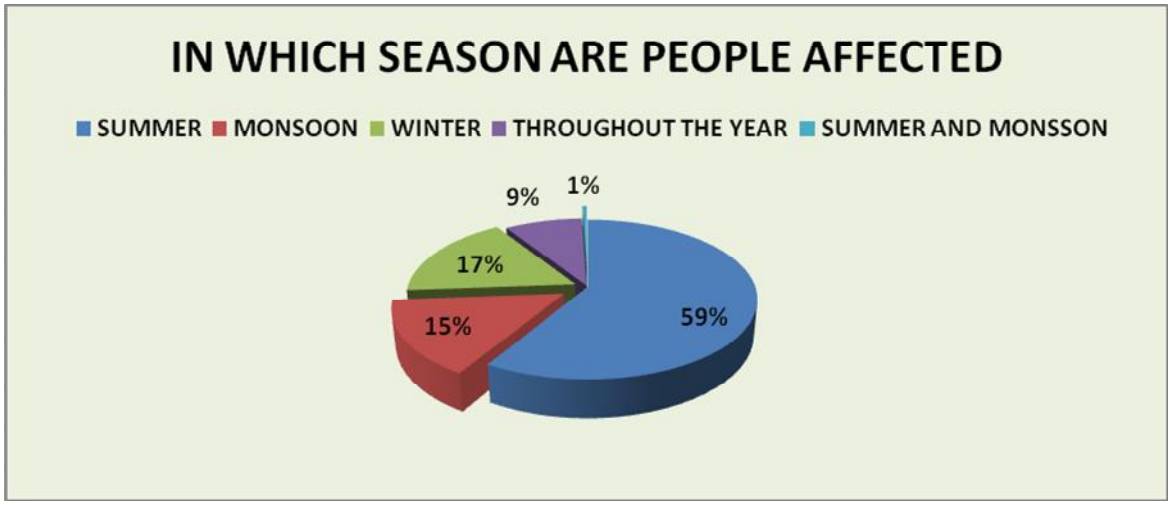
KQ11	Frequency	Percentage
Yes	53	25.2%
No	94	44.8%
Don't know	63	30.0%
Total	210	100.0%



Many people were not aware if the eye condition had affected anyone in the village or their community.

Q12: Is there any season for this eye condition where people are affected more?

KQ12	Frequency	Percentage
Summer	123	58.6%
Monsoon	32	15.2%
Winter	36	17.1%
Throughout the year	18	8.6%
Summer & Monsoon	1	0.5%
Total	210	100.0%

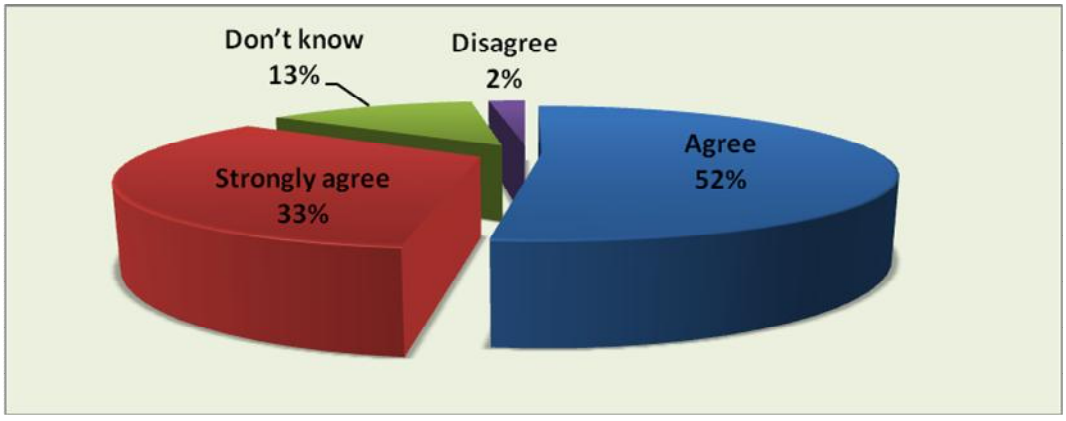


Most of the respondents correctly pointed out that the eye condition was more prevalent in the summer season. They felt the low water level in the ponds caused the organisms present in the pond water to come in touch with the body, which is responsible for the disease.

ATTITUDE

A1: Do you think this problem will start by taking bath in the pond water?

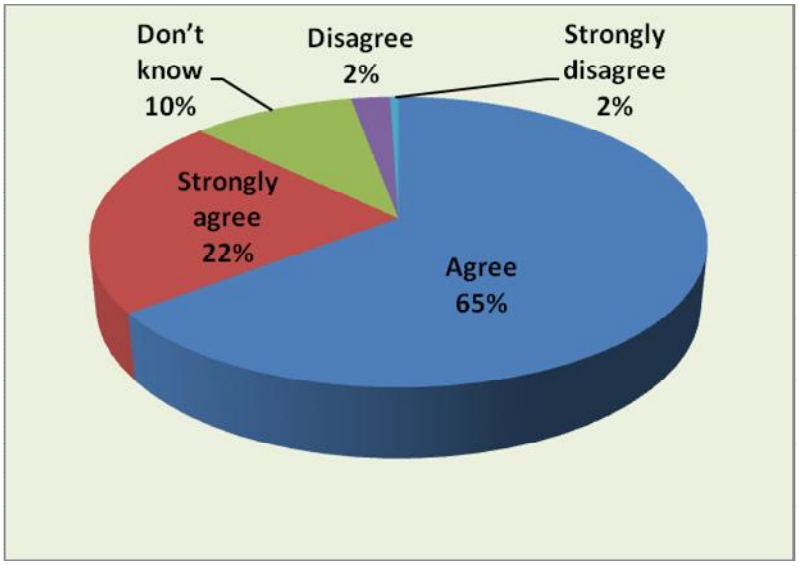
AQ1	Frequency	Percentage
Agree	109	51.9%
Strongly agree	69	32.9%
Don't know	27	12.9%
Disagree	5	2.3%
Strongly disagree	-	-
Total	210	100.0%



Nearly 80% people felt that the eye condition occurred due to taking bath in the pond water. One third of the respondents strongly agreed to the above fact.

A2: Is the problem curable?

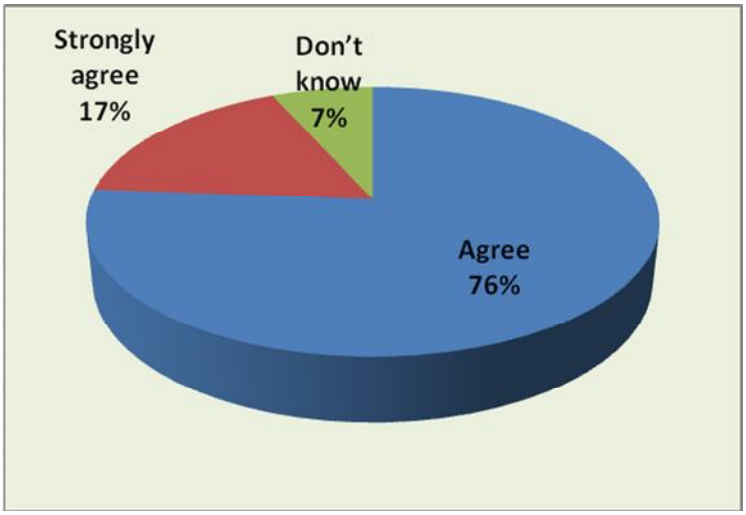
AQ2	Frequency	Percentage
Agree	136	64.7%
Strongly agree	47	22.4%
Don't know	21	10.0%
Disagree	5	2.4%
Strongly disagree	1	0.5%
Total	210	100.0%



85% people believe that the there is cure for the disease. Few people were however not aware of the treatment available for the condition.

A3: Does this condition affect the vision?

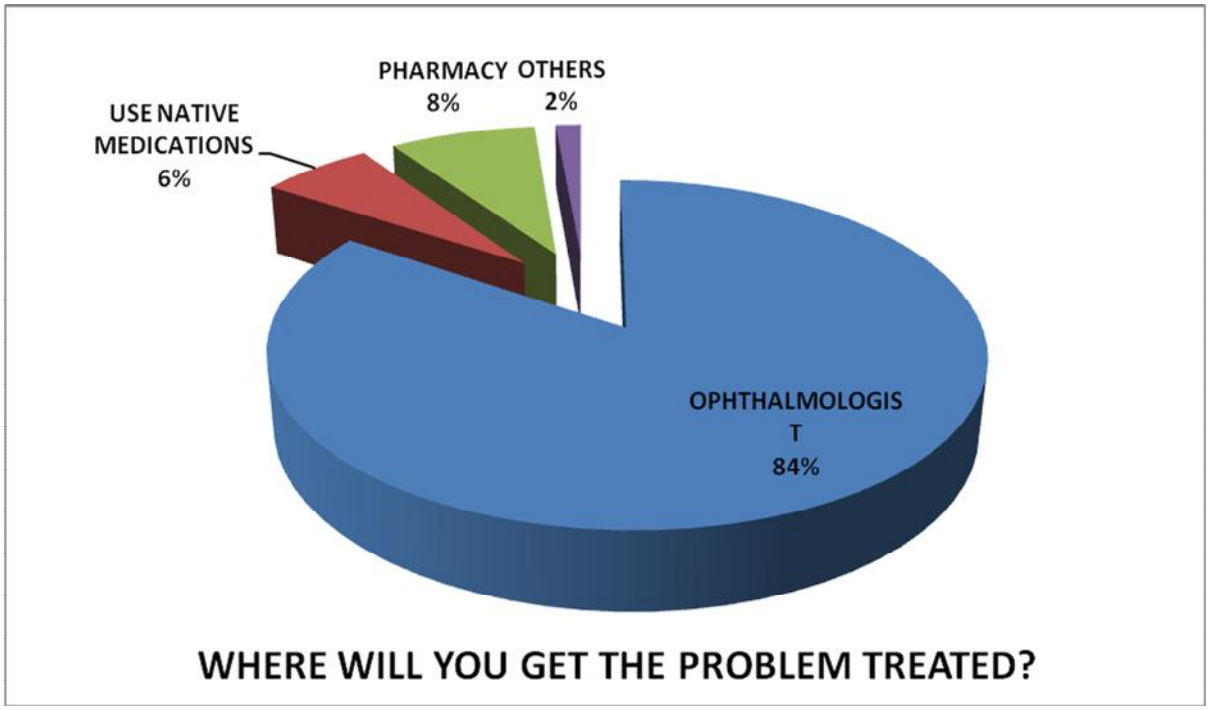
AQ3	Frequency	Percentage
Agree	160	76.2%
Strongly agree	36	17.1%
Don't know	14	6.7%
Disagree	-	-
Strongly disagree	-	-
Total	210	100.0%



Nearly all the villagers believed and agreed that the condition affects the vision. It leads to decrease in the vision along with other features such as redness, pain, watering and irritation.

A4: Where will you get the problem treated ?

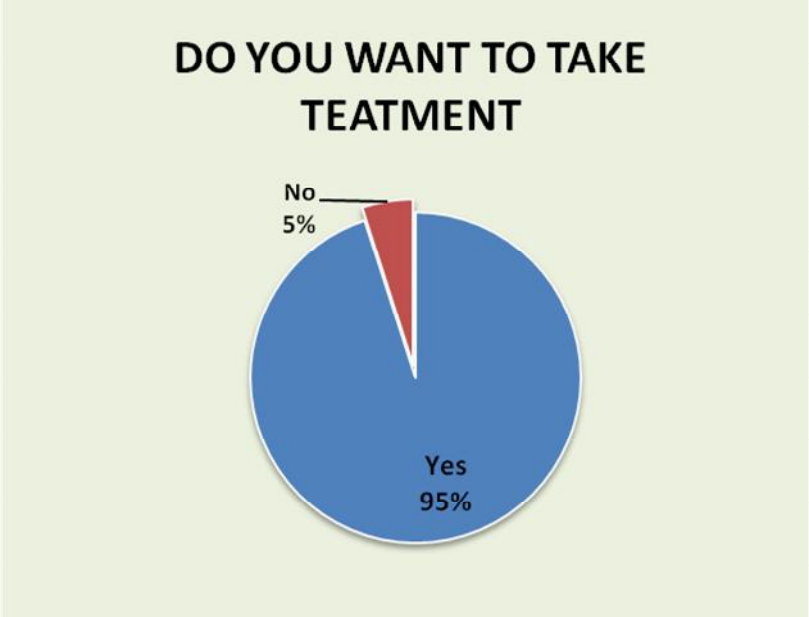
AQ4	Frequency	Percentage
Ophthalmologist	177	84.3%
Native medication	13	6.2%
Pharmacy treatment	17	8.1%
Others	3	1.4%
Total	210	100.0%



Majority of the respondents said that they would approach an ophthalmologist for treatment. Few of them believed that native medication or treatment from the pharmacist would cure the condition.

A5: Do you want to take treatment for the condition?

AQ5	Frequency	Percentage
Yes	200	95.2%
No	10	4.8%
Total	210	100.0%



Majority of the respondents were willing to take treatment for the eye condition.

A6: How would you approach the eye condition?

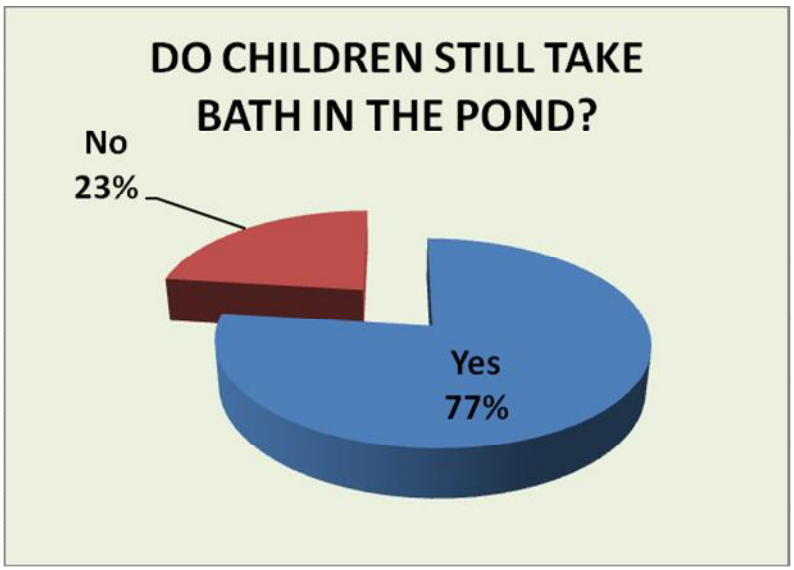
AQ6	Frequency	Percentage
Wait for healing	25	11.9%
Give importance	175	83.3%
Casual	10	4.8%
Total	210	100.0%

Most people said that the eye condition was a serious illness and that they would give importance to it. Majority said that they were willing to take treatment for the same without much delay.

PRACTICE

P1: Do your children still take bath in the pond?

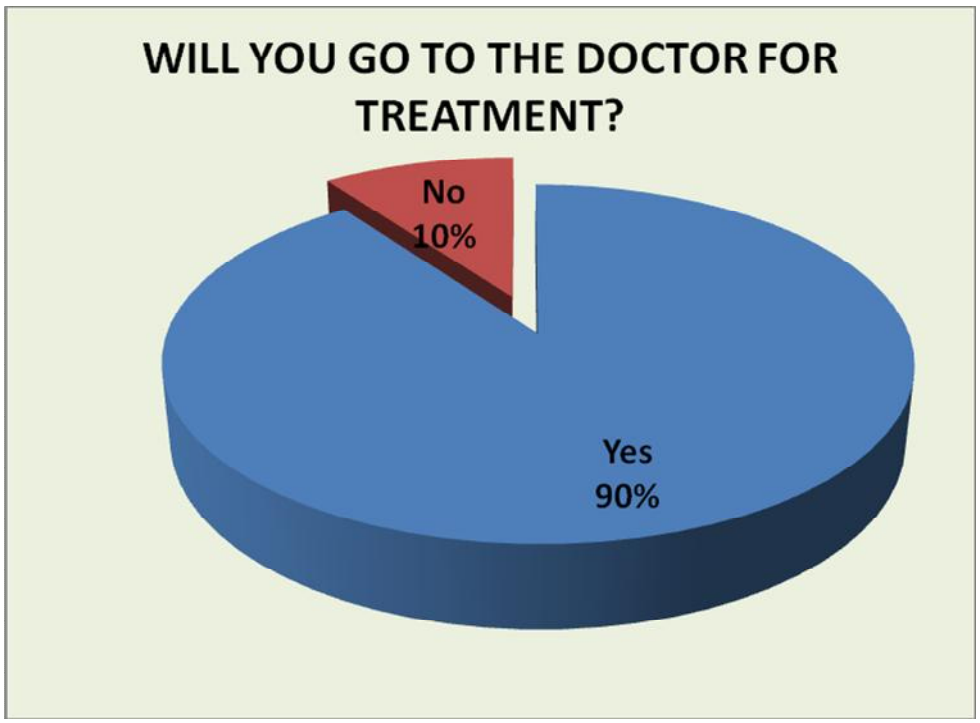
PQ1	Frequency	Percentage
Yes	162	77.1%
No	48	22.9%
Total	210	100.0%



It was surprising to know that even after having a fair knowledge and a good attitude about the condition, most children still take bath in the pond water. This is due to the fact that no other water source is readily available.

P2: Will you go to a doctor for treatment?

PQ2	Frequency	Percentage
Yes	190	90.5%
No	20	9.5%
Total	210	100.0%

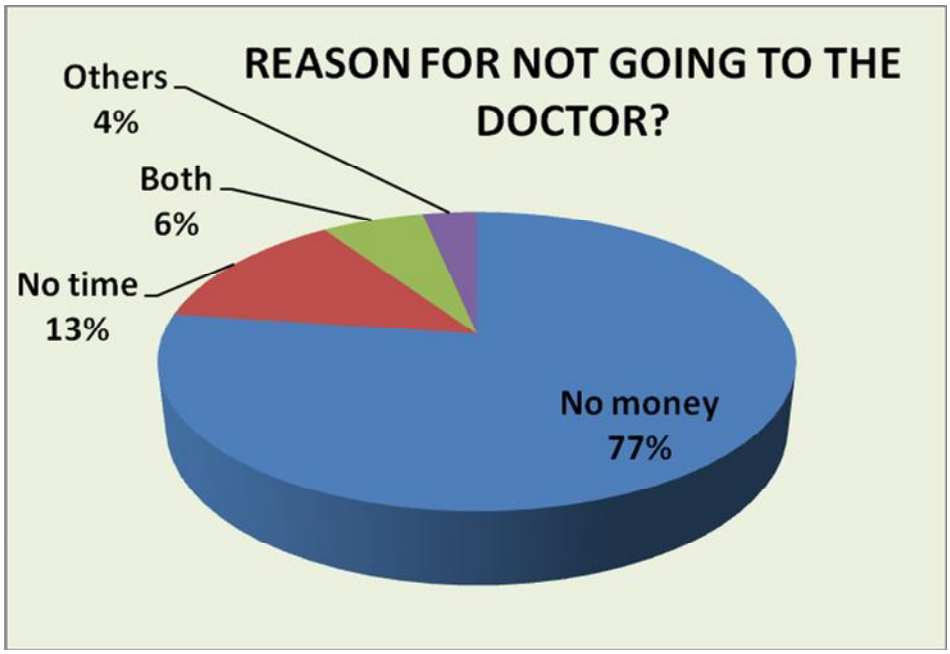


Nearly 90% of the people said that they would visit a doctor for the treatment.

P3: What is the reason for not going to the doctor?

PQ3	Frequency	Percentage
No money	162	77.2%
No time	28	13.3%
Both	13	6.2%

Others	7	3.3%
Total	210	100.0%



Though majority of the people wanted to go to the doctor for treatment, financial problems were the main reason for not consulting a doctor.

P4: How soon will you go for the treatment?

PQ4	Frequency	Percentage
24 Hours	117	55.7%
1 Week	89	42.4%

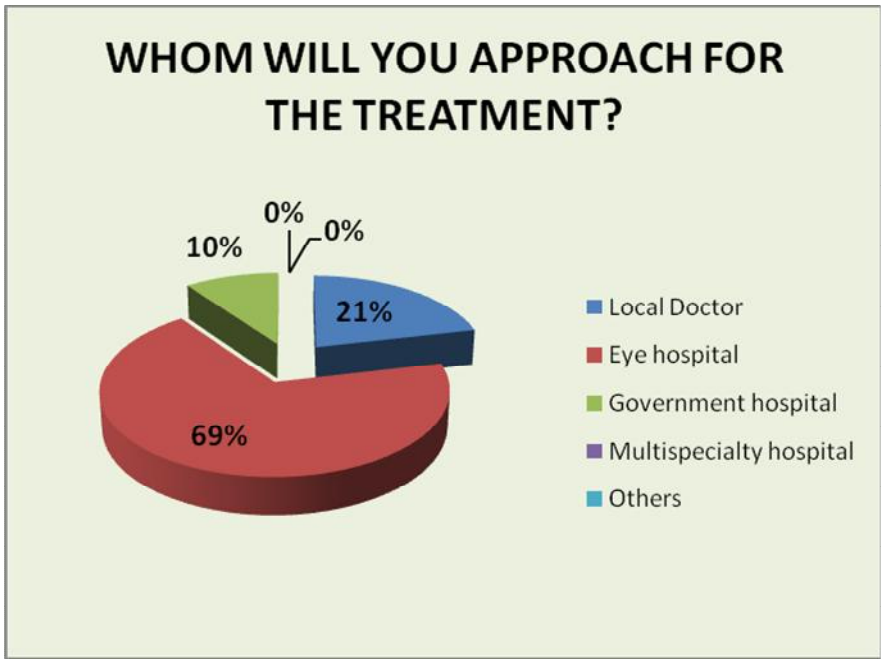
1 Month	4	1.9%
Total	210	100.0%

Nearly half of the respondents said that they would visit a doctor within 24hours if the condition affected their eyes. However 42% people said that they would wait for a week for the condition to resolve naturally.

P5: Whom will you approach for treatment?

PQ5	Frequency	Percentage
Local Doctor	45	21.4%
Eye hospital	144	68.6%

Government hospital	21	10.0%
Multispecialty hospital	-	-
Others	-	-
Total	210	100.0%

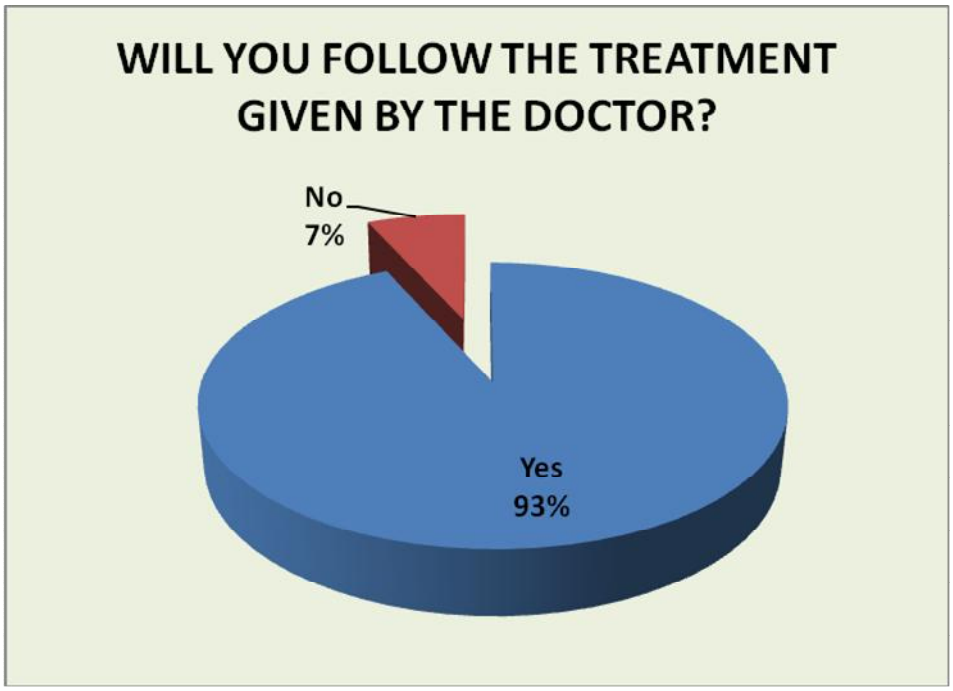


Majority of the villagers said that they would approach an eye doctor for the treatment. Here there is there is a possibility for bias, as the questionnaire was administered by an ophthalmologist.

P6: Will you follow the treatment given by the doctor?

PQ6	Frequency	Percentage

Yes	196	93.3%
No	14	6.7%
Total	210	100.0%



93% of the people said that they would follow the treatment given to them by the doctor.

DISCUSSION

In recent years increasing emphasis has been laid on the active participation of individuals and communities in successful disease control programmes. Population-based studies, in contrast to hospital-based studies, provide a relatively unbiased picture of various aspects of the disease in question.

Many studies have been conducted to assess the knowledge, attitude, and practices (KAP) of residents towards diseases such as dengue[23, 24], rabies[25], kalaazar[26, 27], leptospirosis[28] and tuberculosis[29]. In my discussion I am going to compare the results of my study with these previously conducted KAP studies.

Trematode induced uveitis is a major public health problem in parts of Tamil Nadu and its prevention and control are priorities. The present study was, therefore, undertaken to study respondents KAP towards trematode induced uveitis, with the aim of using the data collected in a practical way to control the disease at the individual and community levels.

The results of our study revealed that the people had a fair knowledge about the disease condition. Nearly 47 % of the respondents thought that the disease was caused due to infection.

In a similar study on the Knowledge, Attitude and Practices about dengue in the South Indian population, Ashok kumar et al showed a poor prevalence of disease knowledge in the south Indian population. Only 34.5% of the households were aware about the cause of dengue infection.[23]

The cause for low awareness about both the diseases can be the reason for the increase in its prevalence. As the people are having poor knowledge and awareness of the diseases, the prevalence of the diseases are more.

In our study, little more than a third of the people felt that the disease occurred most in the age group of 6-15 years and 47.6% people said it occurred more in males in comparison to the females. Majority of the people (62.8 %) said that the condition presented as redness, watering, pain, photophobia and irritation. 62.4% of the people felt that the condition occurred due to taking bath in the pond water. They felt that some germ or insect in the pond water was responsible for the disease outbreak.

Faisal et al through their study on the KAP of dengue also showed that more than half of the parents (54%) had good knowledge about symptoms, and modes of transmission of dengue infection.[24]

The increase in awareness about the symptoms of trematode induced uveitis could be because of other acute eye conditions such as conjunctivitis or foreign body in the eye presenting with a similar picture.

Nearly 60% of the respondents said that trematode infection of the eye could be prevented by not taking bath in the pond water. More than half of the population felt that the people were affected by the disease more in summers. They felt it was due to decrease in the water level during the summer season.

Matibag et al in their study on the KAP of rabies showed that there was a good awareness about the prevention of rabies. 88% of the respondents were aware that rabies could be prevented by vaccination.[25]

The high level of awareness about the prevention of rabies can be attributed to the fact that a lot of information is available about rabies, its mode of transmission and prevention in the public domain. The severity of the disease and the high rate of mortality are also reasons why people are more knowledgeable about rabies.

68.1 % people believed that there was a cure for the disease. Though the knowledge about the disease condition was present amongst individuals,

many of the people were not aware if there was anyone else affected in the village.

Attitude and Practices towards the disease:

Most participants agreed that trematode induced uveitis is a serious illness. About 51.9 % agreed and 32.9 % strongly agreed and appreciated that the disease occurred due to taking bath in the pond. People were aware of the nature of the disease. Also, about 80% of participants strongly agreed (22.4%) or agreed (64.7.4%) that the disease is preventable and curable.

S.Koirala in his report about kalaazar reported that 78.9% respondents were aware and agreed that kalaazar is a preventable disease.[26]

This shows that people have good faith in the current medical science and its treatment options.

More than 90% of the respondents in our study agreed that the disease affected the vision. Majority of them understood the seriousness of the disease and wished to get the problem treated by an ophthalmologist if they contracted to it.

In spite of having a fair knowledge and a positive attitude about the disease 77.1% people in our study said that their families still take bath in the pond as there is no other source of fresh water for taking bath.

Siddiqui et al in their report mentioned that though people had a fair knowledge and awareness of kala-azar disease, 66 % of them were not using any prevention methods to avoid contracting to the disease.[27]

In a similar report by Mohd. Rahim S et al. on the knowledge attitude and practice towards leptospirosis amongst town service workers also showed an unsatisfactory practice score of 64% [28].

From the above mentioned comparisons, it is clear that the knowledge and attitude of the people is not translated into practices. It is possible that the information provided by public domain is insufficient to address the lack of understanding in disease prevention. Other than lack of knowledge, it is possible that the respondents cannot find time to conduct activities that relate to disease prevention, lack of skills or some other factors hindering preventive practices. More health awareness programs and community work is required to prevent people from contracting such diseases.

Though 90% of participants in our study wanted to go to a doctor for treatment of the condition, they said money was the key factor they could not go. Majority of them were from low socio-economic backgrounds who

could not afford to take treatment. If they visited the doctor for treatment many of them said they would follow the treatment given to them correctly.

R K Swamy in his project on tuberculosis under RNTCP mentioned that money and social stigma were the main causes which prevented people from going to take treatment.[29]

Poor socio-economic background and social stigma still remains prevalent in our society. They are the main reasons which prevent people from taking treatment from a doctor.

From the foregoing, it is apparent that most people had a fair knowledge of the disease condition and a positive attitude, very few people engaged in positive preventive practices. People still allow their children to take bath in the pond in spite of having good knowledge that the disease spreads by taking bath in the pond water. The fair knowledge and average positive attitude about trematode induced uveitis did not translate into high levels of preventive practices.

The data obtained in our study can be very useful for planning and evaluating the control activities. The results indicate that a serious and consistent effort is essential to educate the people in the endemic areas about trematode induced uveitis, its transmission and treatment. This can be achieved by planning newer health programs and training the health

workers. Community participation also plays a key role in disease control programs. The ways in which a community can participate are; by providing the shape of facilities, manpower, logistic support, active involvement in planning, management and evaluation.

However the findings of the study must be interpreted in the light of some limitations. As the survey was carried out by a doctor, some participants may have provided socially desirable responses to some questions. The small sample size may have limited the ability to detect associations that were small in magnitude. The pre- coded options may have forced respondents to choose an undesirable answer.

CONCLUSION

Until recently, anterior chamber Granulomatous uveitis was thought to be tubercular in etiology. However recent studies done by a group of investigators proved it to be trematode infection of the human eye. The disease is more prevalent in the children of the eastern coast of Tamil Nadu. These children of South India live along the Kaveri river bed. It causes visual impairment particularly among the young. Unawareness regarding this new disease leads to its delayed diagnosis.

Extended burden of disease and limited treatment options are special challenges to trematode uveitis.

In our study we analyzed the knowledge, practice and attitude of trematode induced Granulomatous uveitis amongst the residents living in the endemic areas along the Kaveri river bed to have a baseline data.

From our results we find that the people have a fair knowledge about the eye condition. Most people correctly perceived that the disease is more prevalent in children of age group 6-15 years with a predisposition of affecting males as compared to females They have a good knowledge about the symptoms of the disease. Very correctly most respondents pointed out that the infected pond water is the source of infection. However not many

were aware about the mode of transmission. People also believe that the condition is more prevalent in summer season due to unknown reasons.

The attitude of the residents towards the disease is also positive. They feel it is a serious eye problem. Nearly all the respondents agreed that the condition causes defective vision. Many of them are willing to go to an ophthalmologist for treatment if they or their children incurred to the disease. Majority of the people are aware that treatment for the eye disease is possible but they were not aware of the treatment facilities available close to them.

However the positive attitude of the people did not translate into their practices. Children still continue to take bath in the infected ponds in spite of having knowledge about the mode of spread of the disease from those ponds. The main reason for the poor practices can be attributed to the fact that there is no other source of water in many villages for taking bath. Though many people were ready to consult a doctor if the disease affected them, few people said that lack of money and time was a reason for not taking treatment from a doctor.

Through this cross-sectional study, we investigated the point prevalence and KAP of trematode induced uveitis in a geographical area of the south Indian State of Tamil Nadu. The data obtained from this study can

be very useful for planning and evaluating control activities. The results indicate that a serious and consistent effort through public health services is essential to educate the villagers about trematode uveitis, its transmission, prevention and treatment. Promotion of literacy and health education in these areas can be followed by a RE KAP study to know the effectiveness and impact of the various health programs and campaigns carried out to create awareness amongst the people. Efforts must also be taken to clean the pond water in these endemic areas. Clean tap or ground water should be made available for the people to take bath. Issues related to geographical location, finances and accessibility to hospitals should be carefully examined.

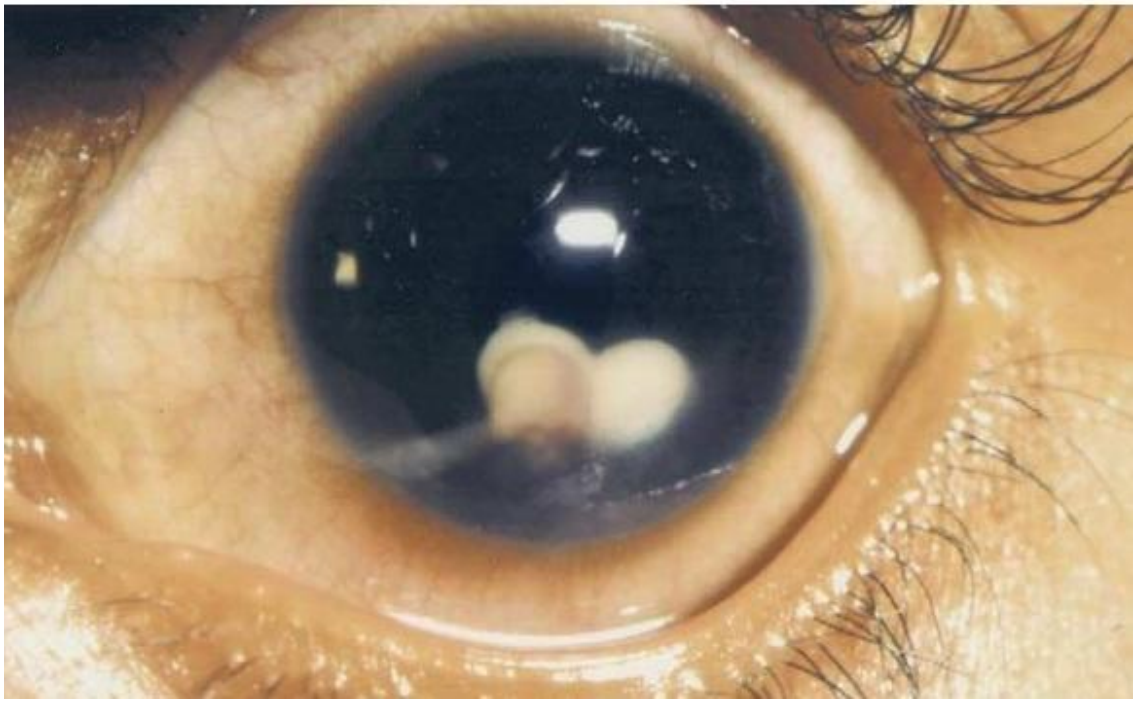
Henry Sigerist quoted "The people's health ought to be the concern of the people themselves. They must struggle for it and plan for it. The war against disease and for health cannot be fought by physicians alone. It is a people's war in which the entire population must be mobilized permanently." [30]

Along with the support provided from the health care providers, active community participation is also an essential component to reduce the burden of the disease. Health can never be protected adequately without the active understanding and involvement of the communities whose health is at stake.

Village freshwater pond where the children took bath

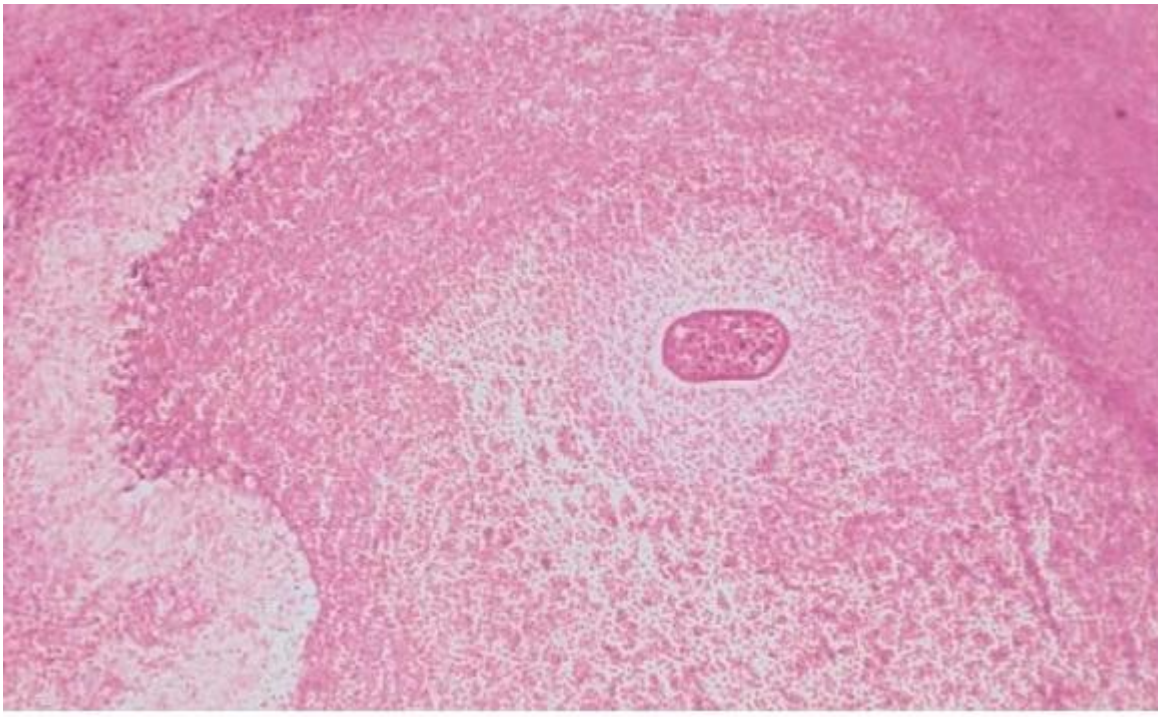
The clinical presentation of the infected children

Subconjunctival nodule



Multiple anterior chamber nodules

HISTOPATHOLOGICAL EXAMINATION



Conjunctival nodule showing zonal granulomatous inflammation

composed of a central area of necrosis and inflammatory cells surrounded by epithelioid histiocytes

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PROFORMA

PATIENT NAME

AGE SEX M.R.NO

NAME OF INFORMANT

ADDRESS

MOBILE NO

DATE

STUDY NO

FOOD CONTROL

CONSENT

I HEREBY AGREE TO GIVE THE INFORMATION THAT I KNOW. IT CAN BE USED FOR THE STUDY

SIGNATURE

KNOWLEDGE

1) From where do you get your drinking water?
   1) Pond 2) Well 3) Pump 4) Other

2) Do you know about this eye problem that is shown in this picture?
   1) Spreading infection 2) Assault 3) Curse 4) Do not know

3) In which age group is this eye problem seen maximum?
   1) 0-5years 2) 6-15 years 3) 16-20 years 4) > 21years 5) All 6) Do not know

4) In which gender is it seen maximum?
   1) Male 2) Female 3) Both

5) What are the symptoms?
   1) Redness 2) Photophobia 3) Watering 4) Pain
   5) Irritation 6) All the above 7) others

6) How does this eye problem start?

1) Pond water 2) Food 3) Drinking water 4) Others

7) Do you know how does it spread?
   1) Insect in water 2) Water 3) Outside food 4) Direct contact

8) Do you know how to prevent it?
   1) Boiling water 2) Well cooked food
   3) Not taking bath in pond 4) Isolation

9) Is there a treatment for this problem?
   1) Yes 2) No 3) Do not know

10) Is anyone else affected in your home?
   1) Yes 2) No 3) Do not know

11) Is anyone else affected in your village?
   1) Yes 2) No 3) Do not know

12) In which season are people affected?
   1) Summer 2) Monsoon 3) Winter
   4) Throughout the year

ATTITUDE

1) Do you think this problem will start if you take bath in pond water?
   1) Agree 3) Do not know 4) Disagree
   2) Strongly agree 5) Strongly disagree

2) Is this problem curable?
   1) Agree 3) Do not know 4) Disagree
   2) Strongly agree 5) Strongly disagree

3) Does this problem affect your vision?
   1) Agree 3) Do not know 4) Disagree
   2) Strongly agree 5) Strongly disagree

4) How will you get the problem treated?
   1) Will go to ophthalmologist 3) Pharmacy
   2) Native med 4) Others

5) Do you want to take treatment for this problem?
   1) Yes 2) No

6) What is the approach for this problem?
   1) Normal process 2) I will give importance
   3) Nothing serious

PRACTICE

1) Do your children taken bath in pond?
   1) Yes 2) No

2) Will you go to doctor for treatment?
   1) Yes 2) No

3) What is the reason for not going to doctor?
   1) No money 2) No time 3) Both 4) Others

4) How soon will you go for treatment?
   1) 24 hrs 2) 1 week 3) 1 Month

5) Who will approach for the treatment?
   1) Local doctor 3) GH 4) Multispecialty hospital
   2) Eye hospital 5) Others

6) Will you follow the treatment of the doctor?
   1) Yes 2) No

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